Report of
The Maryland Agricultural Society—
Maryland Farm Bureau Federation,

INCLUDING REPORTS OF THE

Maryland State Horticultural Society,
Maryland Crop Improvement Association,
Maryland State Beekeepers' Association,
Maryland Vegetable Growers' Association,
Maryland Stockmen's Association,
Maryland Tobacco Growers' Association,
Home and Community Committee Meeting,
Maryland State Poultry Council
4-H Club Conference,

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REPORT OF THE

MARYLAND AGRICULTURAL SOCIETY

THE

MARYLAND FARM BUREAU FEDERATION

Including Reports of

The Maryland State Horticultural Society
The Maryland Crop Improvement Association
The Maryland State Beekeepers' Association
The Maryland Vegetable Growers' Association
The Maryland Stockmen's Association
The Maryland Tobacco Growers' Association
Home and Community Committee Meeting
The State Poultry Council
4-H Club Conference

Volume XXI, for the Year 1936

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BALTIMORE, MD.

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LETTER OF TRANSMITTAL

To His Excellency, Harry W. Nice,
Governor of Maryland.

Sir:

I herewith submit to you, as directed by the Act incorporating the Maryland Agricultural Society, and also the Horticultural Society, this report for the year 1936, which contains a detailed statement of the receipts and expenditures of the Society as approved by the Executive Committee and Advisory Council. It contains the proceedings of the Twenty-first Annual Meeting of the Maryland Agricultural Society, Maryland Farm Bureau, Inc. and annual meetings of the Affiliated Associations.

I trust that an inspection of its contents will convince you that the funds appropriated for this purpose have been wisely and judiciously expended.

Respectfully submitted,

CHARLES E. WISE, JR.,
Secretary.

April, 1937,
Baltimore, Md.

64916

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CONTENTS

The Maryland Agricultural Society—The Maryland Farm Bureau Federation

Page

Letter of Transmittal ... 3
Board of Directors, Maryland Farm Bureau, Inc., 1937 ... 4
County Farm Bureau Officers, 1937 ... 5
Maryland Farm Bureau Federation Officers, 1937 ... 7
Officers Affiliated Associations, 1937 ... 7
Annual Address by President Harry H. Nuttle ... 11
Annual Report by Secretary-Treasurer—C. E. Wise, Jr. ... 15
Report of the Auditing Committee ... 22
Address—Morris L. Cooke, Rural Electrification Administrator ... 29
Address—W. F. Childs, Jr., Highway Planning for Maryland ... 39
List of Winners in Maryland Farm Bureau F. F. A. Project Contests for 1935-36 ... 46
General Session ... 48
Report of Credentials Committee ... 49
Address—Forward Planning—Mrs. J. D. Giles ... 50
Address—Harvey Hull—President of the United Cooperatives ... 54
Address—(Summary)—Chester H. Gray—A Forward Look in Farm Legislation ... 64
Report—Home and Community Committee ... 66
Address—Farm Family Outlook—1937—Gladys Gallup ... 72
Report—State Tax Committee ... 83
Resolutions of Maryland Farm Bureau Federation—1937 ... 94

Maryland State Horticultural Society

Report of the Secretary-Treasurer ... 119, 120
President's Address—C. E. Bryan ... 120
Address—Diagnosing the Lack of Fertilizer Elements for Orchard Trees—J. H. Weinberger ... 121
Address—Present Equipment and Methods for Effective and Safe Washing of Eastern Apples—D. F. Fisher ... 126
Address—Can the June Drop of Fruit be Controlled by the Grower—Laurenz Greene ... 132
Address—Detail Pruning to Assist in the Production of Better Apples—A. L. Schrader ... 138
Notes on Spray Injury Studies in Virginia—W. S. Hough ... 141
Address—Spray Materials in Relation to Spray Injury—Pennsylvania—H. W. Thurston, Jr. ... 143
Address—Weather as a Factor in Causing Spray Injury—West Virginia Experiments—F. J. Schneiderhan ... 151
Address—Spray Injury Investigations—Maryland—J. S. McConnell, and E. J. Anderson ... 160
Address—New Packages for Fruit—L. C. Carey ... 165
Address—Liming and Fertilizing Cover Crops and Sod in Maryland Orchards—H. E. Klingaman ... 172
Address—Adjusting the Spray Program and Materials to Control the Codling Moth—W. S. Hough ... 176

CONTENTS—Continued

Page

Address—The Color Factor in Fruits—J. H. Gourley 179
Address—Culture and Handling of Raspberries and Blackberries—J. Harold Clark 181
Address—Raspberry Disease Control—George L. Zundel 188
Report on Progress of Appalachian Apples—Carroll R. Miller 193
Address—Making the Delicious Apple Bear Profitable Crops—M. A. Blake 199
Address—Is Mulching a Profitable Practice in the Orchard?—J. H. Gourley 204
Report of Auditing Committee 210
Report of Nominating Committee 210
Report of Resolutions Committee 210

Maryland Crop Improvement Association

Program 213
Address—Soybeans, Recent Developments—F. H. Shelby 214
Address—Soybeans in Maryland Rotations—J. E. Metzger 218
Address—Markets and Uses of Soybeans in Maryland—K. W. Baker 219
Address—Progress in Cleaning and Treating Wheat and Barley in Maryland—J. D. McVean 220
Address—Pasture Investigations in Southern Delaware—George L. Schuster 221
Address—Pasture Problems of Western and Northern Maryland—Fred V. Grau 225
Address—Hybrid Corn—R. G. Rothgeb 233
Report of the Secretary-Treasurer 238
Treasurer's Report 240

Maryland State Beekeepers' Association

Financial Statement 242
Report of Extension Activities in Apiculture for 1936—G. F. Abrams 243
Progress Report of the Maryland Beekeeping Industry—William F. Boarman 251
Address—National Honey Market—Harold J. Clay 254
Address—Ability of Honey to Absorb and Retain Moisture, and Practical Applications to Promote Greater Use of Honey—R. E. Lothrop 259

Maryland Vegetable Growers' Association

Address—Variety Trials in Maryland for 1936—H. B. Cordner 267
Address—The Wholesale Fruit and Vegetable Market in Baltimore City—Roger F. Burdette 281
Address—Use of Rotenone and Pyrethrum in the Control of Vegetable Insects—Ernest N. Cory 288
Address—Summary of Seed Potato Studies in Maryland—R. A. Jehle 291
Address—A Comparison of Some of the Results Obtained from Fertilizer Placement Studies at the Virginia Truck Experiment Station—M. M. Parker 295
Address—Information on Lime and Fertilizer Needs of Truck Soils—R. P. Thomas 299
Report of Committees 300

Maryland Stockmen's Association

President's Address—Stanley P. Stabler 303
Report of Secretary-Treasurer—B. E. Carmichael 305
Financial Report 306
Address—Baltimore's Eighth Annual Livestock Show—W. R. Harvey 310
Address—Livestock Sanitary Work in Maryland in 1936—Mark Welsh 318
Report on the Progress of the Cooperative State and Federal Program for Bang's Disease Elimination—L. McL. Merryman 323
Address—4-H Livestock Club Developments in Maryland, 1936—M. S. Downey 326
Address—Round Table—Horses—Edward Derr, Humphrey Finney 328, 330
Round Table—Beef Cattle—W. A. McGregor 332
Round Table—Sheep—Sam O'Sullivan, John E. Muncaster 333, 340
Round Table—Hogs—Fred C. Ernst, J. Herbert Snyder 340, 345
Round Table—Marketing—J. C. Cash 346
Address—Maryland's Livestock Opportunities—Kenneth C. Ikeler 347
Address—Greetings from the University of Maryland—H. C. Byrd 349
Address—The National Livestock and Meat Board and Its Work—Redman B. Davis 352

Maryland Tobacco Growers' Association

President's Annual Address—Hon. Thomas Parran 361

Maryland State Poultry Council

Brief Reports by Committee Chairmen 363
Address—Egg Marketing Opportunities Maryland Poultrymen Are Overlooking—James M. Gwin 365
Address—Poultry Research and Extension Program for Maryland—Morley A. Jull 366
Address—T. B. Symons 370
Address—Developing an All-Round Poultry Department to Serve the Poultry Industry—H. C. Byrd 371
Address—Value of Poultry Improvement Program to the Poultry Industry—H. A. Bittenbender 372
Address—Better Prices for Maryland Poultry Products—W. D. Termohlen 374
Address—Mrs. W. W. Hopkins 377
Report of the Economic Stabilization Committee—S. H. DeVault 380
Report of Committee on Education and Research—George D. Quigley 385
Report of Publicity Committee—A. H. Snyder 386
Report of Secretary—W. H. Rice 389
Report of Resolutions Committee—Mrs. W. W. Hopkins 391

Boys' and Girls' 4-H Club Leaders Conference

Round-table Discussions 394

REPORT

OF THE

TWENTY-FIRST ANNUAL MEETING

OF THE

Maryland Agricultural Society

Maryland Farm Bureau Federation

JANUARY 13-15, 1937

Lord Baltimore Hotel, Baltimore, Maryland

Wednesday Afternoon, January 13

MR. SAMUEL LINTON presiding.

Invocation by Reverend C. E. Wise.

MR. LINTON: I am sorry that Mayor Jackson was unable to be with us at this time, but we will have his address of welcome later. The President of the Farm Bureau, Mr. H. Nuttle, will now deliver his address.

ANNUAL ADDRESS

PRESIDENT HARRY H. NUTTLE

It is with pleasure that I again greet the Maryland Farm Bureau in annual convention assembled. I am sorry that I have been unable in reality to put on top of my head all the hair that the Baltimore Sun put there in their picture of a year ago. Yet lack of hair doesn't bother me much. I think maybe it worries my wife more than it does me. My situation reminds me somewhat of the favorite limerick of the War President, Woodrow Wilson.

"For beauty I am not a star
There are others more handsome by far
But my face, I don't mind it
For I am behind it
It's the people in front that I jar."

I hope I don't jar you too much, for I believe I am speaking to the best people in Maryland. You are the leaders in farm organization work in your counties. Your counties have recognized your leadership by sending you to this convention.

To belong to the Farm Bureau you must have vision to see the future and realize how the farmer will lose out if he does not organize.

Then, you must be willing to sacrifice time, energy, and money to bring that organization into being and keep it functioning. Many times do we get tired of giving so many of our neighbors a free ride, but we must not give up, for the future of agriculture depends upon us.

While we do not agree in many instances with methods used, labor organizations of the country are certainly showing us what aggressive organized action means, and giving further indication of the fact that we as farmers must fight for fair consideration for our industry.

We have gone through a strenuous year. Just one year ago, when we gathered in this room, there was discussion everywhere of the action of the Supreme Court which invalidated the AAA. That action was taken just a few days before our 1936 meeting, and about the time that we were meeting here your elected directors of the American Farm Bureau Federation were in Washington demanding some substitute program to protect and foster our national agricultural interests. Their work resulted in the enactment of the Soil Conservation Measure. This soil conservation program, which farm organizations proposed to replace the AAA, is not perfect. We believe, however, that it does lay the ground work for a sound program for the farming industry. We all recognize that the wealth of our soil must be conserved or we will have some of China's erosion, drought, and famine ahead of us. Being paid for better farming practices appeals to us in Maryland, and we believe that the return in conservation of our national resources justifies this course of action on the part of all people. We believe also that there should be a continuation of study, experimentation, and trial in the field of adjusting production to consumption that we may not have a repetition of over-burdening surpluses, which have been so common in agricultural production. It is hardly necessary to mention the plight of our Maryland turkey producers this year to bring this need home to you.

A second feature of the year is the growing recognition of the fact that Real Property bears an unfair share of our tax load. We will continue our efforts for additional relief for real estate, in the face of the fact that even though the depression is over, more taxes will have to be raised to meet the rising expenses of government. We must be especially watchful of our legislators lest in the search for other sources of revenue, after proposing this tax, and that tax and the other tax, they do not eventually drop some of the load on Real Estate. A farm or a house cannot be hid and is so easy to tax.

The third feature of the year has been the excitement of a presidential campaign and election. Through our National organization the needs of agriculture were forcibly presented to the conventions of both major parties. Your leaders wisely chose committees to make the presentations which were made up of leaders in our organization who were most recognized by the parties to which they made the presentation. You need no further proof of the power of organi-

zation than the fact that the platforms of both parties included the demands of organized farmers almost in their entirety. It is now our job to see that the victorious party makes good on its promises.

Another important development of the year was the uniting of the Southern States Cooperative and the Agricultural Corporation of Maryland. For several years the Agricultural Corporation has not had sufficient business to enable it to function effectively. In other words, there was not enough volume to secure adequate concessions from manufacturers, or to justify establishment of our own plants.

I remember a trip Mr. Evans, Mr. Wise and I made to Chicago to renew our feed contract with our source of supply. They raised their charge for mixing from $2.75 to $3.50 per ton and frankly told us they did not care whether we accepted it or not, as our volume of business was so small. Nor was the business of the Corporation sufficient to take care of the necessary overhead. Mr. Cockey did a fine job as president and manager and no one could have made a more gallant fight than Mr. Evans. But every year we impaired our capital, at least a little. Frankly, something had to be done. There were two courses open—First, liquidation, with the Farm Bureau getting out of the cooperative feed and fertilizer business, or, second, uniting with another cooperative. I am purposely leaving out a third possibility, a tie-up with a stock corporation, for we believe any profit from our commodity activities should come back to the users and this can only be done through cooperatives.

Of all the cooperatives which we contacted, Southern States appealed to us the most for several reasons:

1st. It was already a competitor and a combination would eliminate competition and provide additional volume at the same time.

2nd. It had a source of supply of feed and fertilizer within the state, convenient to both shores—a feed mill costing over $300,000, and now a fertilizer plant which originally cost over $800,000, and both in Baltimore.

3rd. It had a big volume of business—over six million dollars last year, sufficient to cut overhead and guarantee competing prices.

4th. It furnished a service in good seed to farmers that is unexcelled anywhere in the East.

5th. Its reputation for quality was at the top.

6th. It was adequately financed.

7th. It was adequately manned.

After much negotiation, a contract was signed making the Agricultural Corporation the sole distributing agent of Southern States in Maryland—with management to be furnished by Southern States.

There have been some misunderstandings as to the meanings of certain phases of the contract, but they are gradually being ironed out. Moreover, it is too much to expect that such a consolidation would take place without creating hardships for some of the agents, or causing situations in some counties that are disturbing. It is my sincere belief that Mr. Wysor and Mr. Agnew are square shooters, big men who know the cooperative business, and that in sponsoring the Southern States in Maryland we are doing more for the farmers than any one thing the Farm Bureau of Maryland has ever done in the commodity line. Our only excuse for existence is that we may serve the farmer and here we are bringing him a real cooperative, one that can and does have profits, and passes those profits back to the farmer in patronage dividends.

On Friday morning the official delegates will gather to formulate our organization program for the coming year. It is well for us to remember that we are recognized, as farmers, as a favored class. I do not mean by that that we are to be accorded anything that we do not deserve. But the attitude of our National leaders is that every effort should be made to increase the income of lower income groups, and we are in that class. We should not lose the opportunity that we now have for securing a better deal for the farming interests of the country.

It is my belief that the weakest part of our Farm Bureau organization in Maryland is the lack of functioning committee activity in our County Farm Bureau units on the problems which are of interest to our members. We should bend every effort to correct this weakness during 1937. Our Secretary, Mr. Wise, will offer some concrete suggestions for getting this job done.

What is the goal toward which we are working? The old aim was expressed as "equality for agriculture." Secretary Wallace in his speech to the recent convention of the American Farm Bureau Federation in Pasadena expressed it differently and in a way that I like. He called it "Agricultural Security." We hope and pray that as a result of our activities in the county, state, and nation our sons and daughters who take our places in agriculture will have greater security economically, greater security politically and greater security morally than we have enjoyed. To that do we direct our activities.

MR. LINTON: We will now have the Secretary's annual report, Mr. C. E. Wise, Jr., Secretary of the Maryland Farm Bureau.

Mr. Wise gave his address as follows:

ANNUAL REPORT

C. E. WISE, JR., Secretary-Treasurer

The year of 1936 has been a very active one for the Maryland Farm Bureau, for its leaders and members. This activity was stimulated by the changing conditions in general business, in the government and in the agricultural situation. The Maryland Farm Bureau with its broad scope of activities has kept abreast and ahead of the transition, although some of its many projects have not been given the attention they merit. It is safe to say that more fundamental changes have occurred in 1936 than in any preceding year of the organization's life.

First came the forced change in our national agricultural program as applied to the state. New national legislation was needed and its application to our farms was required. Our leaders have taken an increasingly important part in setting up and administering the soil conservation program in Maryland. This represents one of the primary philosophies of the Farm Bureau, one of the definite objectives for which it was created, mainly, to provide an organization of farmers which will work with educational and governmental agencies to formulate and carry out agricultural programs and policies, nationally and locally.

Your state officers worked with the national officers in the formulation of this new program. When it was presented in Congress, the entire state organization supported the act and materially assisted in its passage. Maryland Congressmen voted 100% for this measure—a better record than any other state in the entire east. The state committee is composed of Farm Bureau leaders—the same is true in practically all our counties. Too much praise cannot be given the Maryland Extension Service for the efficient manner in which it has conducted this major project that has enrolled 15,000 Maryland farmers. How many of these realize the part the Farm Bureau has played in this program? We have been so busy working on this project that our organization's story has been neglected. The year 1937 offers another opportunity to tell the facts and drive home the truth of the statement "We are living in an age in which no producer, be he farmer or manufacturer, is a law unto himself; an age in which the only way a farmer can run his own business is to join hands with his neighbor farmers in an organization that has the facilities and that through the strength that lies in combined effort, is able to protect his interests."

There have been changes or additions in practically all of the cooperative enterprises sponsored by the Maryland Farm Bureau. Our insurance program has made rapid progress and has added about 3,800 coverages in 1936. Life insurance was added to our program in May—Maryland was the first state outside of Ohio to contract for

and sell life insurance. Since May the Cooperative Life Insurance Co. of America has written over $300,000 worth of insurance in the state. At the November meeting of the insurance Board, authorization was granted to make farm loans in Maryland. While no loans have been made to date, we are in position to offer this service to our farmers. Since July the state office has been writing surety bonds for the Farm Bureau and cooperative officials in the state. In 1937 these new enterprises will be further expanded and the benefits offered to our members. Before the 1938 annual meeting, fire insurance will be added to the growing list of insurance services available to Maryland farmers through the Farm Bureau.

Early in 1936 the Eastern Livestock Marketing Association passed through the most trying period of its existence. It has made splendid progress during the year under new management.

A livestock marketing service was inaugurated by the Farm Bureaus in Kent, Queen Anne's and Talbot Counties. This was the first effort to market lambs cooperatively in this section and it resulted in increased prices for lambs throughout the entire Shore. Similar projects are needed in all of our livestock counties to build up business for the Eastern and to increase the returns to producers of livestock.

The Maryland Wool Pool made an increase of 50% in wool handled and materially benefited its growers. The first advance offered was 19c per pound and later increased to 24c. At this time local prices paid averaged 27c. Part of the Maryland wool was placed in an advance sale and a return of 35c per pound guaranteed on clean wool. As soon as this announcement was made, local buyers met it and thus the Farm Bureau Wool Pool raised the price of all wools sold thereafter in Maryland 8c a pound.

The Farmers' National Grain Marketing Corporation was completely reorganized during 1936 and is starting with a strong capital structure. This grain marketing service is a valuable one to Maryland farmers and the Farm Bureau has a definite task to maintain and build this service during 1937.

Probably the most far reaching and fundamental change in our state activities was in the commodity service. In May the Agricultural Corporation entered into a contract with the Southern States Cooperative effective July 1, 1936. Under this contract, the Agricultural Corporation became the sole and exclusive distributor of Southern States products in Maryland and was assured the supervision of experienced personnel. Our leaders had been working on this combination for several years. The objective of this move was to eliminate competition between cooperatives, eliminate duplication of effort and distribution expense with the goal of better service on commodities to Maryland farmers. This was the unselfish thought behind the move that was heralded by many as the biggest accomplishment of

the year. Those of you who have not been in contact with this move probably do not realize the many problems inherent in such a transaction. It is a difficult proposition to coordinate two organizations and here we have three involved. The combined business of the organizations will amount to over a million dollars the first year. The officers of Southern States, the Agricultural Corporation and the Farm Bureau are constantly working on this problem to the end that a unified service will result. Their first consideration is service to Maryland farmers. Our problem in 1937 is to secure coordination of the Farm Bureau-sponsored service and make it available to every member in Maryland.

We have studied the distribution of petroleum products for several years and this service will be developed during 1937. In 1936 the Maryland Farm Bureau, Inc., was accepted as a member of the United Cooperatives and has paid $1,000 for stock in this cooperative. United Cooperatives is successor to the Farm Bureau Oil Co. that has its own oil blending plant in Indianapolis. Maryland farmers pay more money for petroleum products than for any other single item including feed, seed, and fertilizer. The Farm Bureau has pioneered for open formula feeds and fertilizers and for known origin seed. Farmers know less about the oil they use in cars, trucks and tractors than they do about feeds. The purchase of oil on specification is important and this will be incorporated in the commodity program sponsored by the Farm Bureau in 1937.

A special session of the Legislature was called in March of 1936 to levy taxes to provide revenue for the state and county relief programs. The joint tax committee of the Grange and Farm Bureau prepared a comprehensive tax report. This report opposed the then gross receipts tax, any general sales tax and recommended taxes on luxury commodities plus an income tax for the needed revenue. The state office sent a copy of this report to the Governor, to each delegate, and senator. Your secretary contacted members of the Legislature and pushed the tax program during the entire session. There never has been, nor probably will be a more turbulent session of the Legislature. The gross receipts tax, the sales tax and the cigarette tax were all defeated.

The Farm Bureau program was constantly pushed and was always under consideration. The income tax was reported out of committee and was voted on for the first time in many years. It passed the House of Delegates by the largest majority received by any tax measure but was never considered by the Senate Finance Committee. The luxury commodity tax program that was passed by the Legislature was practically the Farm Bureau program.

The special session of the 1936 Maryland Legislature enacted the following tax measures to provide funds for public assistance, includ-

ing old age pensions, aid to the blind, aid to dependent children and general relief.

1. The motor vehicle titling tax of one per cent of the sales value of motor vehicles, passed in the regular session of 1935, was continued.

2. A tax on beer of 75 cents per barrel (or 2 7/16 cents per gallon) was levied on beer sold to retailers in this State.

3. A tax of five cents per gallon was levied on each gallon of whiskey or other spirits distilled for beverage purposes in this State.

4. A tax of one per cent of the gross receipts from admissions to all places of amusement in the State was enacted. In addition, a tax of from 5 to 15 cents is levied upon free admissions or reduced rates of admission to places of amusement.

5. A tax of 10% of the retail price was levied upon toilet articles and cosmetics sold at retail in Maryland.

6. The existing franchise tax rate on domestic corporations was increased 100%, and the existing franchise tax on foreign corporations was increased 200%.

Estimated returns of these revenue measures are placed at $3,500,000. This sum is dedicated to public aid.

The state Legislature is now in regular session and will again act on revenue measures for relief and other governmental needs. A copy of the tax recommendations of your state committee has been sent to each delegate and senator. The complete tax program was printed in the January *Farm Bureau News* and for the first time, every Farm Bureau member has received a copy of the tax report. Support of this program will help insure its success and its success will benefit Maryland farmers.

The National soil conservation act of 1936 provides that it be administered by the AAA until Jan. 1, 1938. After this date all activities must be carried on through some state organization authorized by a state legislative act. The American Farm Bureau recommended that the National Act be amended to extend the time to Jan. 1, 1940. This was done to give more time for study of the results. It is feared that 48 separate state acts will cause considerable confusion. Unless Congress extends the time to 1940, we in Maryland will be forced to pass a state act to insure that our farmers continue to receive the benefits of the soil conservation program. The state office is prepared to push such legislation when and if it is necessary.

Your secretary has been cooperating with a special committee to secure legislation that will curb poultry thieving in the state. There will be other legislation recommended by this convention and presented to the Legislature. The Farm Bureau is in position to secure necessary helpful legislation at Annapolis and the state office asks the continual splendid support of the counties on this activity.

In August, a special meeting of the Farm Bureau and The Agricultural Society was held in Betterton. Here a change was made in the set-up of our organization. The Farm Bureau was incorporated as the Maryland Farm Bureau Inc. and the Maryland Agricultural Society by-laws amended to conform to its Charter as granted by the Maryland Legislature.

The Farm Bureau has increased its membership 9% during 1936, regardless of the many changes and handicaps encountered during the year. Special mention should be made of Charles and Carroll Counties. Charles County is the only county in the state to exceed the membership quota set at the start of the year. Carroll made the largest percent increase. Today we welcome two new counties—Somerset and Calvert—both organized during 1936. Of the 20 Farm Bureau counties, two are newly organized, 12 increased in membership and 6 decreased in membership this year. This is the fourth consecutive year of membership growth and the foundation has been laid for a much larger increase in 1937.

National Secretary Ogg made the following statement in his annual report that will show clearly the direction in which our national organization is headed:

"The Farm Bureau continues its spectacular gain in membership strength for the third successive year, having doubled its paid national membership since 1933 and reaching the highest membership level since the early days of the American Farm Bureau, when this movement swept across the nation like wild-fire."

In spite of the expansion of services rendered by the state office force and the resulting increase in expense, the assets of the Maryland Farm Burau, Inc. increased $335.00 during the year.

It is only proper that as we review the efforts of a year past, that we look ahead and make an outline to guide our efforts. Let us hope that this year can first of all be one without change, rather that it be a year of consolidation, building and progress on the foundation already laid. We are safe in assuming continued business progress as a background for our program, as this has been forecast by both governmental and private agencies. The National City Bank of New York sends out a letter each month on Economic conditions. I quote from their January letter:

"The year 1936 has closed with business at the highest level since the depression began, and 1937 opens with great expectations. There are few industries in this country, and few sections of the world, in which conditions have not shown pronounced improvement.

"For four years the economic system has been pulling itself together. In that period short crops have wiped out the accumulated surpluses of farm products, and farm income has been restored to such effect that farmers of this country, according to the Bureau of Agricultural Economics, have had in 1936 the highest real purchasing

power in thirteen years; this, of course, does not refer to income stated in dollars, which was below 1929, but is after allowing for the greater buying power of the dollar.

"Unquestionably the rise in staple commodity prices has been one of the most important developments of 1936, and one holding great promise for 1937. The advance in farm products and other raw materials during the twelve months has averaged around 25% and this is a world rise, in terms of all currencies and of gold as well. Farmers and other producers of raw materials will have the first benefit, for they will receive higher prices, and also will probably be able to sell more; but the resulting increase in purchasing power, if not absorbed by rises in industrial prices and costs, will flow around the circle, creating business for everyone."

I have quoted about one-fourth of a page out of four pages devoted to this subject. This report mentions as retarding factors the automobile workers' strike and the increase in wheat acreage.

The U. S. Department of Agriculture also makes a cheerful summary for 1937. "The outlook is for further improvement in the economic position of American agriculture in 1937. Domestic demand for farm products is expected to improve, and the foreign demand situation also appears brighter. Industrial production is expected to continue to advance in this country. The national income will probably be about 10 percent greater in 1937 than it has been in 1936. No great expansion in the foreign market for agricultural products is in prospect, but the reciprocal trade agreements program of the United States, and various moves toward relaxation of trade barriers abroad, make the foreign picture a little brighter than it has been in recent years. In general, farm prices are expected to stay at high levels in 1937, although some decline is probable in the last half of the year if crop production is more nearly average than it was in 1936. Credit for farmers will be plentiful and rates will be low in 1937. Taxes may move up slightly, and costs of labor, building materials, machinery, and fertilizer will probably be a little higher. Even though farm costs may be a little higher in 1937 it is believed that more money will be available for farm family living in 1937 than in 1936. A large increase in wheat production and declining prices are in prospect for 1937, both for the United States and for the world as a whole, if growing conditions are average."

At the 1933 annual meeting, Dr. Pearson of Cornell, gave us an interesting lecture on prices. Dr. Pearson and Dr. Warren are two of the outstanding economists of this country. They predicted the depression long before it came. I quote their statement on prices in December *Farm Economics:* "There seems to be no question but that the low point is definitely past, and it looks as if the period of considerable rise in commodity prices had begun."

Assuredly there will be continued general business progress dur-

ing 1937 and considerable credit for this must be given the program of organized agriculture. We can see security ahead for agriculture and our job is to continue our efforts,—as Secretary Wallace expressed in Pasadena: "And so farmers find themselves in this closing month of 1936 with a place of responsibility at the national council table. They are faced with the task of thinking out what policies will not only preserve the gains they have made, but will extend those gains in step with progress made by the entire nation."

There is only one way that we can work out a program and that is to get together more, discuss and work out our problems to solution. Consequently, I recommend that we have more meetings of the State Board of Directors and that these be two-day meetings; the first day for committee action and the second day for the Board meeting and action. Another recommendation is that the committee plan already adopted by the State Board and by county boards be aggressively pushed. Our programs in the past have too often come from the top down. No program so developed can be as successful as one that comes from the locals, then the counties and to the state.

My final recommendation is that we work for even closer contact with the Extension Service. In expressing this I cannot improve on the words of President O'Neal: "In the beginning, the county agents soon saw that they had to have an organization of farmers in order to carry out most effectively the extension program and through the years this policy has proved most effective in the states where it has been tried. We need this fundamental set-up today more than ever before in carrying out all of these great national policies and programs for agriculture. The relationship between the Farm Bureau and the Extension Service should be strengthened throughout the nation and all of the agencies serving agriculture should be coordinated effectively to carry out these programs in the counties and communities."

We made a start on the 1937 program when the annual meeting was planned. During the next three days we will hear outstanding speakers talk on—

Rural Electrification
The Maryland Road Situation
The National Farm Legislative Program
The Development of a Cooperative Program
The State Tax Program

These are all exceptionally live subjects on which we can and must take definite action during 1937. There will be ample opportunity for discussion after each talk.

As we start 1937, we of the Maryland Farm Bureau, have a greater challenge and a greater opportunity than ever before. People are thinking and talking agriculture. They realize its cause is just and consequently we have the opportunity to obtain continued security.

To accomplish this we must organize more fully, we must educate the political leadership in our philosophy, we must put our own house in order in our local and county Farm Bureaus. Then we can go forward and attain more economic stability for Maryland agriculture.

MR. LINTON: We are catching up with our program pretty well. We will now have our Auditor's report, Mr. Roy C. F. Weagley.

Mr. Weagley read the following report, which upon motion, duly made, seconded and carried, was accepted.

SCHEDULE 1.

Statement of Receipts and Disbursements for period from January 1, 1936, to December 31, 1936.

Receipts

Dues		
State	$ 4,375.00	
National	1,750.00	
Publication	875.00	
Associate	240.00	$ 7,240.00
Refunds		
Natl. Convention Expense	136.22	
Traveling Expense, Sec. and Treas.	60.00	
Rent	1,280.87	
Office Expense	138.03	
Organization Expense	26.31	
Bonding Expense	55.00	
Annual Meeting 1936	791.75	
Publicity	235.80	
Salary clerks	270.83	
Auto Expense	65.75	
Auto Expense, Org. Dir.	2.30	
Educational Expense	.25	3,063.11
Insurance		
Auto Commissions	5,857.34	
Auto Renewals	13,348.40	
Life Insurance Commissions	180.79	
Fire Insurance Commissions	192.74	19,579.27
Interest		
Bonds	30.00	
Loans	100.00	130.00

Other			
Agriculture Corp. Note Pymt.		500.00	
T. Fair		149.40	
Salary Inf. Dir.		210.00	
Traveling Exp. Inf. Dir.		70.75	
Summer Convention		5.00	
Over Paid Dues by Counties		47.00	982.15
Total Receipts			30,994.53
Bank Balance January 1, 1936			4,263.89
Available Cash			35,258.42

Disbursements

Dues			
National		1,704.00	1,704.00
Publicity			
Publication		842.68	842.68
Insurance			
Commissions		2,273.09	
Renewals		1,732.86	4,005.95
Salaries			
President		1,200.00	
Sec. and Treas.		3,600.00	
Inf. Director		3,170.00	
Org. Director		1,800.00	
Clerks		2,529.50	
Accountant		180.00	12,479.50
Travel			
Railroad President		187.85	
Railroad Sec. and Treas.		861.43	
Railroad Org. Director		514.19	
Railroad Inf. Director		295.60	
Auto		489.66	
Auto Org. Director		319.46	
Auto Inf. Director		277.02	2,945.21
Directors			
Exec. Committee		371.39	
Directors		689.79	1,061.18

Office			
Rent Tele. and Tele.	2,398.86		
Other Expense	1,266.71	3,665.57	
Educational			
Expense	23.19		
Organization			
Expense	959.61		
Bonding	85.00	1,044.61	
Other			
National Convention Exp.	220.56		
T. Fair Expense	235.25		
Annual Meeting 1936	1,268.62		
Invest United Co-op.	1,000.00		
Summer Convention	309.30		
Automobiles	1,108.00		
Taxes	23.29		
Annual Meeting 1937	4.00		
Dues Over Paid	47.00	4,216.02	
Total Disbursements			$ 31,987.91
Equitable Trust Company Balance December 31, 1936			$ 3,270.51

SCHEDULE 2.

Statement of Receipts and Disbursements for month of December, 1936.

Receipts

Dues		
State	420.00	
National	168.00	
Publication	84.00	672.00
Refunds		
Rent	119.63	
Office Expense	45.98	
Publicity	3.50	
Salary Inf. Director	90.00	
Traveling Inf. Director	62.10	321.21

Insurance			
Auto Commissions		507.62	
Auto Renewals		1,146.85	
Life Ins. Commissions		43.54	
Fire Ins. Commissions		30.42	1,728.43
Other			
Auto Expense		44.60	
Salary Clerical		50.00	
Agri. Corp. Paid on Note		500.00	594.60
Total Receipts			3,316.24
Bank Balance December 1, 1936			2,688.70
Available Cash			$ 6,004.94

Disbursements

Publicity			
Publications		42.00	42.00
Insurance			
Commissions		182.50	
Renewals		285.90	468.40
Salaries			
President		100.00	
Sec. and Treas.		300.00	
Inf. Director		350.00	
Org. Director		150.00	
Clerks		200.00	
Accountant		10.00	1,110.00
Travel			
Railroad Sec. and Treas.		14.90	
Railroad Org. Director		41.47	
Railroad Inf. Director		27.77	
Auto Org. Director		41.77	
Auto Inf. Director		85.52	211.43
Directors			
Exec. Committee		28.00	
Directors		14.50	42.50

Office			
Rent Tel. and Tel.	199.02		
Other Expense	165.81	364.83	
Organization			
Expense	223.71	223.71	
Other			
Annual Meeting 1937	4.00		
Natl. Convention Expense	220.56		
Dues Over Paid	47.00	271.56	
Total Disbursements			$ 2,734.43
Equitable Trust Company Balance December 31, 1936			$ 3,270.51

SCHEDULE 3

Statement of Assets as at December 31, 1936.

Liquid			
Cash in Equitable Trust Co. Active Account		$ 3,270.51	
Cash in Union Trust Co. Checking Account		524.66	
Cash in Equitable Trust Co. Saving Account		4,084.60	
Union Trust Co. Certificate of Beneficial Interest (In Safe Deposit Box)		349.24	
U. S. Treasury Bonds 3 (In Safe Deposit Box)		1,960.00	
Accounts Receivable as per Office record		1,088.39	
Live Stock Association Note (In Office Safe)		2,054.00	
Agricultural Corp. Note		1,500.00	
United Cooperative Inc. Investment		1,000.00	
Total Liquid Assets			$ 15,831.40
Fixed			
Furn. and Fixtures	$ 3,021.86		
Less Depre. Reserve	2,281.72		
Net Book Value		740.14	
Automobiles	1,533.00		
Less Depre. Reserve	589.00		
Net Book Value		944.00	
Total Fixed Assets			$ 1,684.14
Total Assets			$ 17,515.54

Analysis of Accounts Receivable as to age:		
Accounts on books longer than six months	760.18	
Accounts on books less than six months	328.21	
Total Accounts Receivable		$ 1,088.39

AUDIT COMMITTEE

The auditing committee appointed by the president to examine the annual audit of the treasurer submits the following report:

The books and accounts of the Maryland Farm Bureau Inc., have been audited by a certified public accountant, and your committee has examined the audit as prepared. This report will be printed in full in the annual report and a copy forwarded to each county for the information of all members.

It has always been the policy of the Farm Bureau to spend available funds for service to members. However, it is gratifying to report that the state organization has added $335.60 to its assets during 1936.

All obligations have been paid up to and including December 31, 1936.

Respectfully submitted,

A. G. ENSOR,
CLAUDE C. PHILLIPS,
LINWOOD O. JARRELL,
R. C. F. WEAGLEY.

MR. LINTON: Now, friends, I am going to ask our President, Mr. Nuttle, to introduce the next speaker.

MR. NUTTLE: We had aimed to have a representative of the Southern States speak to you briefly tomorrow, but it is impossible for him to be here tomorrow, and so I will ask Mr. W. G. Wysor, the manager of the Southern States, to speak to you. They are building up a cooperative program, and we will hear from him at this time.

MR. WYSOR: Mr. Chairman and ladies and gentlemen: Harry Nuttle made a splendid presentation of the cooperation which has been accomplished between the farmers of Maryland and the Southern States Cooperative, and the logic of that coordination is plain. I do not know of a single wholesale producing cooperative which I believe is really successful and really efficient which has operated on a Statewide basis. The cooperatives which are rendering good service and doing it at an advantage to the farmers are those cooperatives that are operating on a regional basis. The reason is that there is not

enough volume of business in any one State to keep costs low enough and to permit, as Mr. Nuttle says, the ownership of the necessary facilities for manufacturing. I would like for you to review with me for just a moment what we as farmers in this Middle Atlantic region have with which to do this job of cooperative purchasing. I mean the farmers who own and use cooperative farm machinery. In the first place, we have the necessary capital, about two million dollars of effective capitalization, about one million of that, by the way, represents capital which farmers have paid into this institution, the farmers' investment in it. The other means his borrowed capital. Secondly, we have the necessary plants or manufacturing facilities. After all, we have general plants for manufacturing or processing here in Baltimore that you are mostly interested in. Then, we have the trained men and women with which to operate this business. In my opinion, and I am not just saying that,—that is the best asset we have. It is worth more than a million dollars, that farmers have invested in it,—the experienced men and women that know how to run it successfully.

Then, we have a distribution system to render the necessary retail service on these supplies, consisting of between 700 and 800 concerns scattered over the various States.

Then, we have developed an accounting system through which farmers can keep track of this cooperative business and measure its efficiency, and then we have gotten the business going, if I may put it that way, with enough volume to keep the cost low, and to operate it efficiently.

Mr. Nuttle mentioned the volume last year, about $6,000,000. That is growing. This fiscal year,—six months of which have passed,—at the rate we are going we will have $9,000,000. The organization is shipping an average of some 40 or 50 carload lots of farm supplies in one day and that constitutes a growing business in any man's land. Now, it seems to me that we have everything necessary to protect the interests of the farmers, the economical rights. You know when you go into this you are going into business. It is an economic thing, and the purpose of that business is to control the quality of our farm surplus, and to control the cost of that farm surplus by doing those things. We will advance agriculture by increasing the earnings of our farmers, and that means better standards for life on the farms.

It seems to me that we have everything necessary to do that job with one possible exception, and I do not believe there is going to be any exception,—and that is the question of the farmers' support, and I am speaking now about the State of Maryland. Most of you folks are Marylanders. As Mr. Nuttle mentioned, this cooperative movement could not be accomplished without some friction here, and I want to tell you in that connection that cooperation is not something, gentlemen, that somebody does for us. It is something that we do for ourselves, and the benefits that we get out of it are in proportion to

what we put into it, to the support we give it, and I believe we are all big enough that we are not going to retard or impede this program by petty considerations or jealousy, or friction of any kind among ourselves; that we are going to work for what is best for the advancement of the farmers of Maryland. If we do that, we will give this program our aggressive and voluntary support,—and that is what it takes. May I stop there to point out to you that with this nine or ten million of business which our cooperative institutions are doing this year, it is possible to make, and we are making better prices, lower prices, nearer the cost of the raw materials in fertilizers than ever in the history of any organization, and notwithstanding that fact we are accumulating and earning between three and four per cent on the gross volume of business done. In other words, each $100 that you spend for these supplies adds to the accumulated earnings which your organization is making, and between 3 and 4 per cent will be returned to you in patronage dividends at the end of the period, whenever your Board of Directors thinks it best to provide for that. I am not making a promise. I am telling the facts. Our patronage dividends were not less than 3 per cent for this year. That means a good many thousands of dollars for the State of Maryland, besides lower prices for supplies.

My own feeling is that if we give this program our loyal and aggressive and voluntary support, if we produce the volume necessary to operate these plants at their capacity, within two or three years we will have a cooperative service that will stand second to none in the whole world. Thank you for your consideration.

MR. LINTON: Mr. Nuttle said we have some high spots in our program for today, this afternoon and tomorrow, but this afternoon we have two high spots, subjects of vital interest to everyone of us. One is that of Rural Electrification, and the other is Good Roads. Coming from the extreme Southern part of Maryland, it gives me extreme pleasure to present to you today, Mr. Morris Cooke, Administrator of Rural Electrification. We have a problem down my way, and to hear him today is one of the main things that brought me to this meeting; so, I say it is indeed a pleasure to present to you at this time Mr. Cooke.

RURAL ELECTRIFICATION IN SPITE OF THE EXPERTS

By MORRIS L. COOKE,
Rural Electrification Administrator

In the old copy books there is a poem about a boy who was given a job to do. Immediately a swarm of calamity howlers set upon him with their wails. It couldn't be done, they said; there were "obstacles"; others had tried and failed, it wasn't worth wasting his time, it just

couldn't be done. But the poem ends "He started to grin as he tackled the thing that couldn't be done—and he did it!"

That is what happened to the Federal rural electrification program. When the Federal Government first undertook to help farmers get electric service, less than two years ago, we received all sorts of advice. People who should have known better told us it couldn't be done; the saturation point had been reached, farmers couldn't afford it, the private companies would take care of the situation without help as soon as the proper time arrived. They outlined all sorts of supposedly insuperable obstacles.

Well, let's look at the record.

Nineteen hundred and thirty-five was the biggest rural electrification year since 1928; 1936 was the biggest in history, about twice as active as 1935 and twenty times as active as 1933; and 1937 promises to exceed 1936 by a wide margin. REA allotted funds for about 225 specific rural electrification projects up to the first of this year; they are located in 39 States and Alaska, and will bring service to about 150,000 farms.

Of course, the job is not yet done; we have hardly started. There are 6 million farms in this country still without electric service. But we have seen enough accomplished to confound the earlier disparagers and to demonstrate that a very major dent in that 6 million farms can be and will be made.

The trouble with many of the so-called experts was that they couldn't see the woods for the trees. Each of them saw just one phase of the problem. Just like the editors of the Literary Digest in the recent census, they somehow failed to take all of the factors into consideration.

In the absence of experience and the pertinent facts, the best of us are apt to jump to conclusions. A 3-year-old guest at the Mayflower Hotel in Washington recently made a trip in the elevator with Senator J. Hamilton Lewis of Illinois. A few minutes later she was heard to say, "Oh, sister, I just came up in the elevator with a man who had pasted fur on his face." As the story goes the Honorable Senator gave the young lady an opportunity some days later to get the facts and to satisfy herself that those familiar facial adornments sometimes affectionately known as pink whiskers were not pasted on.

This tendency to judge anything new by restricted and specialized training and experience makes it impossible to get much help from the observations and the reports of the rural electrification experts of the past, and that is where the Federal rural electrification program comes in.

I say "comes in" advisedly, because that program cannot be understood by people who think of it apart from the government's total rural life program. It may sound like a paradox but I know you will understand me when I say that in setting up the REA, the Congress

was not interested in going into the electrical business for its own sake. The inspiration of this program was identical with the inspiration of our program of soil and water conservation, the conservation of our forests and natural resources generally. The erosion of our farm population during recent decades is certainly a matter of as grave national concern as the wind and flood erosion of our agricultural soils. If we are to check that human erosion, we must see to it that the people who are engaged in the fundamental work of producing the nation's food supply have access on fair terms to the technical and cultural facilities that are essential to the American way of life.

Rural electrification has come to be indispensable not only to soil and water conservation but also to man and woman and child conservation. The development of the radio, for example, has put electricity in the same class with the school. It is the tendency of the experts to neglect these human considerations in their book-keeping, their tendency to narrow their calculations to the percent return utility stock, that lead so many of them to warn us that what the government instructed the REA to do just couldn't be done.

It will be interesting to you, I think, to review some of the warnings we received—largely unsolicited—when we undertook this rural electrification program.

The first of these lugubrious complaints is always "The farmer can't afford it; his annual cash income is only $250, on the average." This is a widespread misconception of the fact. Only a couple of months ago Mr. C. W. Kellog, President of the Edison Electric Institute, said in a magazine article that the sale of electricity to the farms (I am quoting Mr. Kellog) "fairly bristles with difficulties." One of these difficulties, Mr. Kellog says, is that according to reports two-thirds of the farmers of America have a gross annual income of $400 or less per farm.

There was just a little truth in the statement that the farmer could not afford electricity. The farmer could not afford to pay the outrageous charges for individual extensions, the exorbitant rates for electricity, which were in effect in some areas. Right here in Maryland and not so many years ago the farmers in some areas were required to pay the cost of the line to serve them, and then pay something like 15c or 17c a kilowatt-hour for current. When something approaching a reasonable attitude was adopted by the companies, and the utility commission came closer to realizing the importance of electric service to the farmer, these unjustifiable terms were changed. You know the result. The farmers hooked up with the power lines—over 500 of them in 1936, according to the *Electrical World*—and started to use electricity.

But the average cash income, of course, is not $250 per farm; in 1933 it was over $800, a year later more than $900, and in 1935, when REA was first created, the average farm income throughout

the country was more than $1,000. Last year another increase was registered, and the prospects for this year continue good.

Another angle of this matter of farm income was disregarded by the earlier prophets. No matter what the farm income is, electricity properly and generously used will increase it. You poultrymen who have electricity would hardly get along without lights in your poultry house, without electric brooders—you couldn't afford to. You dairymen served with electric energy have learned to count on the premium which comes from electrically cooled milk. Many of you are learning that electric hotbeds will give you stronger, sturdier plants and let you get your produce to market ahead of the peak, and that irrigation will make you very largely independent of dry spells. Over on the Eastern Shore, some of you have learned that your best vegetable crops can be frozen, and stored for months to command good prices in out-of-season markets.

Of course, these remarks apply to the 18 percent of Maryland farmers who have electric service. There are still more than 35,000 Maryland farms without it.

The final answer to the income bugaboo is that no one ever claimed we could electrify all the farms in the country. Therefore, national income averages have no significance. Obviously, many farms can never be served on a self-supporting line, but if we can manage to get service available to the top quarter of our farms it will more than double what had been done up to the time we stepped into the picture.

Farms of a character that with reasonably good management will not yield their occupants enough to cover the cost of electricity constitute an important part of our rural life problem to which, as the President made clear in his message of January 6 to the Congress, the Administration is giving serious attention.

Our cardinal point is area electrification. We insist that service be made available to entire areas—sometimes just a valley, sometimes a whole county—as a unit. Too often in the past the lines have served just the most prosperous farms in a community, leaving the rest almost permanently debarred from the possibility of service.

When we examine the figures for average income per farm in a whole county, an entirely different picture is presented. In a great many counties in which our projects are located—counties where absolutely no rural line construction had been undertaken before REA—the average cash income per farm, taking the county as a unit, is more than double the national average of $1,000 a year. There were 26 counties in this country where the average cash income of all the farms in 1929 was more than $10,000. In half the counties of the country the average farm income exceeded $1500. The top quarter had incomes starting at $2500 per farm and going up from

there. I think we are right in assuming that those counties can afford the electricity they so urgently want.

Perhaps I ought to say a word about line costs. Rural lines used to be built just like urban lines. In New England there is at least one mile of line with 50 poles. The wires are holding the poles up. Such lines cost too much. Lines better suited to the need, better able to withstand the strains and demands placed upon them, can be built for much less money. The Secretary of Agriculture under Governor Pinchot of my own State of Pennsylvania was "Daddy" Willits—"Daddy," because his son was dean of the Wharton School of the University of Pennsylvania. Secretary Willits was asked only about ten years ago to pay $4000 for just one mile of line to connect his farm. More recently, the usual price of a mile of line in Pennsylvania—and in a lot of other places, too—has been around $2000. Yet the *Electrical World,* leading journal in its field, recently published an editorial entitled "An Orchid for Somebody" calling attention to the reduction in average cost of line from over $1400 a mile a year ago to $1200 now—a drop of nearly 20% in one year. I am proud to say that the editors awarded a petal or so of the orchid to the REA engineers.

Of course, we think this $1200 figure is still rather high. Our co-op borrowers have demonstrated that good, sturdy lines can be built in most parts of the country for $1000 or less. Where conditions are especially favorable, the lines cost quite a bit less than that; in Texas, for example, a cooperative built a whole system for $720 a mile; and Harvey Couch, Arkansas utility executive, just built some lines for about $600 a mile. Mr. Couch, by the way, points out that the farm wife can buy current for her electric iron with the eggs from two hens added to her flock.

One large company will build lines for a guarantee of $12.50 a month per mile and another will build whenever it can sign up an average of two customers to the mile. These are merly two indications of what is going on throughout the country.

This reduction in line costs has a very direct meaning to you folks. The prevalent practice among a large number of utilities is to require a monthly guarantee. These guarantees vary up to 1½%, or even more, of the cost of the line. Most of the cost of bringing electricity out to the country is building the lines. If a line cost $2000 a mile, the customer must guarantee $30 or $40 a month. If the line costs $1000, $15 or $20 a month will provide the same percentage of income.

You people are the ones who pay the bills. I will admit that a power bill of $10 a month is something for a farmer to think about a while before assuming it; but if he can get the same thing for $5 a month he can't afford to be without it. Why, the reduction of $200 per mile which the *Electrical World* cited means that the line will succeed just as well if everyone's bill is reduced $1 a month. Spread

that over a million customers and you can see why the magazine suggests a floral tribute.

Another one of these misconceptions, another point emphasized by the experts, is the matter of use of electricity by the farmer. The normal farmer, we were told, uses electricity only for lighting—he uses only about 300 kilowatt-hours a year. Of course, there *are* a great many farms where electricity is used only for lighting. One look at the rate schedule makes that practice easy to understand. But the average per-customer consumption of electricity in this country is higher on the farm than in the city—about 600 kilowatt-hours per year in the city as against 860 on the farm.

There are many examples where a combination of a reasonable rate schedule and an aggressive sales campaign has raised the consumption far above the average. Just across the Potomac, the Virginia Electric and Power Company sells an average of nearly 2200 kilowatt-hours a year per farm customer. In Georgia, an aggressive sales campaign has raised the average domestic use from the national average of 600 to more than 1100 kilowatt-hours per customer. Two weeks ago in Chicago the president of an Illinois company told me the average use per farm customer on his company's rural lines is now more than 1000 kilowatt-hours a year and that he expected an average of 1500 kilowatt-hours within 3 years with 80% to 90% of the farmers within the territory hooked up to the line. Samuel Ferguson, the competent president of the Hartford Electric Co., reports an average use of about 1000 kilowatt-hours a year per customer, and says that the normal householder should use 8000 kilowatt-hours. The average use in Winnipeg, Canada, is now approaching 5000 kilowatt-hours. Governor Myers of the Farm Credit Administration uses 15,000. So, who can tell what the normal average use of a rural population is going to be when we get rid of taboos of low use induced by high rates, novelty and other deterrents?

There is another factor which is sometimes overlooked. About three-quarters of REA financed projects are cooperative in character. The people have come to understand already that the success of the undertaking depends on the use they make of electricity. They realize that it is very much to their own interests for all the customers to use as much electricity as possible. The more they use the less it costs them. They do not have the feeling that every time they turn on a light they are lining the pocket of some holding company executive or investment trust banker.

This new attitude is already bearing fruit. The cooperatives which have borrowed money from us are very new. Not one of them has been in operation as much as 9 months. It is still too early to draw definite conclusions, but a continuing increase in the number of customers connected to the lines, and a continuing increase each month in the usage of those customers, would seem to indicate that in most of the

projects the full number of customers will be secured and the usage per customer will be raised in the comparatively near future to a level profitable to the cooperative. This, too, is "impossible" according to the experts. It has always, in the past, taken 3 to 5 years to build up a pay load on a rural line.

Even as to the utility of cooperatives themselves there is a wide difference of opinion among the experts. At one of the sessions of the recent annual meeting of the American Economic Association, one speaker looked upon electric cooperatives with "misgivings." Another speaker, however, gave the Swedish cooperatives credit for the present satisfactory set-up of the electrical industry in that country.

While we are not yet in a position to assess accurately the place which cooperatives will ultimately occupy in our national power economy, it can be said that there are a considerable number of electric cooperatives which have been operating successfully for years past, one of them having a good record over 20 years past, one of them having a good record over 20 years including the depression years. Further, the group of cooperatives which have come into being in the last year or two under REA can be given credit for having awakened our 13 billion dollar electrical industry to an opportunity lying right at its door and which, during recent years especially, has been all but ignored.

Another one of these great "obstacles" in our path was the widely held opinion that much farm work could not be done electrically; that the equipment to do it efficiently would cost too much. But the prices are coming down and the efficiency is going up. New machines better adapted to the task, specifically designed for farm operation, are coming into the market.

Let me state an example from my own personal experience. Forty years ago I worked in a machine shop. We had one piece of electrical equipment—the travelling crane. That was a wonderful thing in those days. Now, however, electricity has almost eliminated human lifting in that machine shop. All the machines are run by electric motors. The individual electric drive has completely revolutionized industrial methods.

The same thing can happen, and is happening, in the application of electricity to farming. Up to just a few years ago it was believed impossible to operate a feed grinder, for example, with any motor smaller than 5 horsepower. Now, however, largely through the efforts of George Kable of the Tennessee Valley Authority, a 1-horsepower motor is known to be adequate in most situations. Even a half-horsepower motor is known to be efficient for many uses. And now Mr. Kable says that a quarter-horsepower motor will operate a small feed grinder.

You remember the early automobiles. They were just motorized buggies, complete even to the whip-socket. Automobiles did not

become in any respect efficient until the engineers stopped thinking about putting a motor in a wagon and started a complete re-design. The same thing is happening in farm equipment. In the past, all the effort has been to put an electric drive on old-type machinery. Take milk coolers, for example; an electrically operated milk cooler today is just an old-time ice-box brought a little up to date. The compressor unit is up on top or stuck away in a corner some place, and the whole installation costs a lot of money. Just in the last few months, however, a manufacturer has introduced a self-contained unit.

Electricity has more than 200 uses on the farm today. No one will hazard a guess as to how many new uses there will be in the future. The little gadget known as the electric eye is doing some very remarkable things. The application of that little device to agriculture may have unlimited possibilities. The use of electric insect traps is becoming more and more widespread and more and more valuable. A very promising start has been made in the use of electricity to heat poultry laying houses. Out in the west, soil-heating cable has proved very efficient in turkey brooding. There are even electric brooders for pigs.

One of the greatest uses of electricity on future farms is almost certain to be for irrigation. Electric motors can pump a great deal of water from shallow or deep wells at low cost, making the truck farmer independent of dry spells. Virginia apple orchard operators have found that a spray system of irrigation not only increases the quantity of crops but puts a much larger proportion of the crops into the high quality grades.

Just one more example will illustrate why I say we have accomplished rural electrification in spite of the experts. When we established the REA Electrified Farm, just across the river at Herndon, Virginia, the engineers were able to take advantage of the topography and install a 700 foot span from the road to the farm. It is long, graceful and striking. Well, the president of a utility company, operating in a nearby Maryland area and having very extensive rural lines, went out to the farm. He is a good friend of mine, so when he got back he sat down and wrote me a letter. He criticized that 700 foot span very severely. It would never stand up, he said. It was too long. It was unsafe. He wouldn't permit it on one of his lines. It was merely one of our stunts designed to attract popular attention, but which resulted in headaches for the construction engineer. It just wouldn't work in a normal rural line, he said.

Well, I got a little worried. We really can't afford to make very many mistakes—especially in a demonstration farm which we invited literally the whole world to visit. I asked our engineers to check up. This is their report: In order to reach the farm, the Virginia Public Service Company had to extend its line nearly 2 miles through normal rural territory. The average span on that extension is just under

500 feet. Several of the spans exceed 600 feet. One of them is only 20 feet shorter than the span to the farm which was so severely criticized.

You see, the practice which we put on as a "stunt" had been quietly adopted by the utility company as its normal procedure.

Do you begin to understand why we insist on a fresh viewpoint and an unbiased attitude? All of the people who gave us these dire warnings, which have proved so groundless, are experts in one phase or another of rural electrification. They have been too close to their subjects in the past. What the whole rural electrification program has needed is someone to stand off on a mountain peak and look at it with an eye to the needs of the people who live and work on our farms.

You folks here in Maryland need this new outlook—this unbiased point of view—at least as badly as the people in any other state. In 1936, for example, you increased the number of your electrified farms by about 7%. Yet the national average was a 12% increase. Pennsylvania and Virginia, your neighbors, far outstripped you in this respect. So did New York, which already had twice as large a percentage of its farms electrified as you did here in Maryland.

Perhaps the best step that could be taken here in Maryland to make a real start on rural electrification would be to dissolve the committee made up of representatives of the private power companies, farmers and a professor or two who have nominally, at least, been responsible for the development of rural electrification in this state. I say "nominally" advisedly because I see that in the face of an emergency they have been meeting once in 6 months.

It is not necessary to go into the reasons for the appointments of these state committees, as they have all but disappeared from the scene. The Pennsylvania Joint Committee was dissolved December 31, 1936. Even in those states where the professor members were not paid their salaries through the good offices of the private companies—obviously an anti-social practice—the committees were kept from being very useful because all discussion of rates was barred and rates are the key to any far-flung development of rural electrification.

Just how you Marylanders will decide to organize to push rural electrification is your own concern, but in the light of the fact that Secretaries Ickes, Roper and Wallace have withdrawn from all connection with the committee on the relation of electricity to agriculture and nearly all the state committees dissolved the further usefulness of your local state committee may well be questioned.

Thirty-five thousand un-electrified Maryland farms offer a challenge which you, Maryland farm leaders, cannot longer ignore.

MR. LINTON: Mr. Cooke, your talk is very encouraging, you have a real program, and that program will help much in the State of Maryland. I know it will help Southern Maryland.

Now, we have been proceeding without an official welcome, but I see our genial Mayor has arrived, and we will be glad to have him welcome us. I present the Honorable Howard W. Jackson, Mayor of Baltimore City.

MAYOR JACKSON: Mr. Chairman, ladies and gentlemen, this welcome has been a little bit delayed, but it is no less sincere. As a matter of fact, you do not need any welcome. You know that. When you come here, you are always welcome. I want to apologize for not coming sooner; I had an engagement to go to College Park, where I was honored by being made a member of one of the College fraternities. This is the reason I was late. My being admitted to this fraternity reminds me of what Charlie Schwab said one time about the various badges and medals presented to him. Someone asked him on one occasion "How did you get all of those medals?" "Oh," he says, "this one I got by mistake, and I got all the others because I had that one." Just why they should make me a member of the fraternity I do not know, but I hope to be a worthy member of that fraternity.

I listened with a great deal of interest to the talk by Mr. Cooke, as you ladies and gentlemen did. It took me back to the first telephone that I knew of in Baltimore County, a big farm where my grandparents were for years. They had a telephone and it cost them considerable money to have that telephone line; I believe the line ran back of Back River. I also remember that our neighbors used to come in and telephone their friends in Baltimore; it was quite an event for them to talk over it. Now, I am going right far back; I am remembering things that happened more than 30 years ago, and I want to say, my friends, that I can really remember more than 30 years back. I used to scratch my head and think how people could remember 30 years back, but it does not seem so hard now.

I was thinking how many hens it takes to run a washing machine, and how many hens you must add to the flock to run anything on the farm. As a matter of fact, those hens are growing in value all the time. They tell me this Poultry Council of yours is having their dinner here at the Lord Baltimore while the cattle people have to meet at Childs. They did not invite me to their dinner here, and I like chicken just as well as anyone else. Why should they not figure on the number of hens when they can afford that? We have to figure on those hens and eggs also. They are just as necessary to us. In the factories they have to figure how many hours of labor, and the cost of that labor in order to justify their expenditures for electricity and other things in that factory. Why not figure on the basis of hens as well?

I remember their saying that Harrison Rider, out in Baltimore County, had a machine that turned out money, and when the banks were closed, the folks said, "Let's just get Harrison Rider to turn

out some of that money from that machine." You don't have machines to turn out your money; you have to get it out of your hens, out of your eggs, your other produce.

I am very happy to be here on this occasion. There never was a time, in my opinion, when it was more necessary for there to be cooperation between the people in the city and the people on the farm than at this time. I am very happy to welcome you to Baltimore on this occasion. I want you to enjoy your stay here. I know you will enjoy it whether I want you to or not. I am very glad to have you in Baltimore for this occasion. It is my hope and wish that your deliberations and your consideration of those matters brought before this Farm Conference will result not only to your welfare and your happiness, but to the welfare and happiness of the people in the city as well, because we are certainly dependent upon you.

I am glad to see you, to welcome you to Baltimore officially, and personally I extend to you my good wishes.

MR. LINTON: Before we go into the next high spot, Mr. Weed will lead us in some songs.

Mr. Wise here made some announcements.

MR. LINTON: Now, we will be addressed by Mr. W. F. Childs, Jr., of the Maryland Road Planning Commission.

HIGHWAY PLANNING FOR MARYLAND

By W. F. CHILDS, JR.
Maryland Road Planning Commission

During recent years there has been much written and more said concerning highways in this and other states, and needs for more adequate roads to meet the requirements of ever-increasing vehicular traffic.

From these discussions and writings, accentuated by traffic congestions and constantly growing highway accidents and fatalities, there came a clamor for more carefully planned lanes of traffic.

The first Federal legislative recognition of the need for planning the future improvement of highways was given in the enactment of the Hayden-Cartwright Act in the summer of 1934.

Under sections 1 and 4 of this Act it is provided—"that with the approval of the Secretary of Agriculture an amount not to exceed 1½% of the total apportionment to any state for any year may be used for surveys, plans and engineering investigations in such state, either on Federal Aid systems or extensions thereof, or on Secondary or Feeder roads."

In a number of states the desire to make such a study was keen and the added incentive of Federal financial aid, made possible by this Act started Maryland and 39 other states on a Highway Planning Survey in cooperation with the U. S. Bureau of Public Roads.

The term "State-wide Highway Planning" is significant in that it applies not only to the main highways but to the entire rural mileage of the state.

The Maryland State Highway Planning Survey was organized on July 16 last, and the actual field investigations started on August 3rd. The work in all departments is being diligently and scientifically prosecuted.

The Survey is devoted to a series of related studies that seek to determine the present condition and state of the rural highway system as a whole; to classify the component parts of the system as to service rendered; to prepare the way for the selection of that part of the whole system which, by reason of its relative importance and service, merits its inclusion in the plans for future improvement; and to assemble the facts so necessary to the preparation of an estimate of the cost of owning and maintaining the economically necessary improved system to the exclusion of unsound and shortsighted policies such as have characterized past performance in highway construction and maintenance.

Most of us can go back in our memory some 25 or 30 years, when there was a decided movement for good roads. One was either for or against good roads. This movement led primarily to the construction of short sections of roads that started "nowhere" and most often went "nowhere." They were creations of inter-community jealousies or pleasure inspired and seldom without some form of political significance.

This beginning was not without benefit, however, for it led to the desire for more and better roads which in turn developed into the building of a limited system of state highways. In Maryland, the late Governor Crothers conceived the idea of building a system of main highways that would eventually connect Baltimore City and the county seats of the twenty-three counties of the state. To the exclusion of all other roads, this arterial system was completed. To his credit it must be said that this was the first sound highway planning attempted and placed Maryland in the very forefront of well-roaded states, a position which she has gradually relinquished to other states. This is so often the price pioneers pay.

During these years the development of lesser or local roads was left to local authorities and they, too, grew in mileage. These local roads are now coming, more and more, into their own for consideration as evidenced by more general state supervision over them.

One of the purposes of the State-wide Highway Planning Survey is to make a study of these rural roads to ascertain to what extent they may fit into the economic scheme for highway extension and improvement and to see that they are given proper consideration in the development of the ultimate highway plan.

The State Highway Planning Survey is divided into three separate departments—Inventory, Traffic and Finance.

Survey parties from the Inventory Department have about completed a survey of some 18,000 miles of roads. Automobiles were driven over each and every mile of rural roads, measuring by odometer, its length and obtaining all the information necessary for the preparation of a complete transportation map of the state. From these data we shall know by actual mileage the type, condition, width, restrictions, drainage condition, etc., of each and every mile of road in each county of the state.

On the main roads we are locating all places where the existing improvement is below the standard required for the safe expedition of modern traffic—where sight distances are too short, curvature too sharp, drainage structures too narrow, hazards exist and recording the exact condition of every grade crossing over railroads with exact information on the traffic, both by road and rail. Also, information has been recorded on all railroads, navigable waterways, bridges over major streams, rural railroad stations, wharves, and all commercial or local aviation landing fields.

In addition, the inventory will locate and place on the maps every home, store, mill and factory, church, school, producing mine and quarry, cemetery, social and recreational centers, Federal, state and local parks and reservations to the end that there may be shown every definite origin and destination of traffic in rural territory.

The Traffic Department has established a number of "Key Stations" at important intersections of main highways. At these stations there is recorded data from which it will be possible to establish the main road traffic flow and determine factors of seasonable change. At "Blanket Count Stations," scattered over the state on main and local roads, there is being obtained valuable data on density of traffic, traffic changes and trend and information on origin and destination of vehicles.

Then, too, there have been established at strategic points along the highways loadometer and pit scale stations where buses and trucks are weighed in order to obtain information so necessary to the economic design of the road for the load it must carry.

Finally, the Financial Department is making a study to show what taxes are levied for road purposes; the amount realized; and who pays them; that is, how much is paid by rural and how much by urban residents. These studies will determine how the money raised by these taxes is expended and in what way; that is, how much for construction; how much for maintenance; how much on main roads; how much on lesser rural roads; and how much on streets. It is hoped to ascertain from these studies how the benefits of road service accrue to the several elements—urban, rural, motor vehicle owners, non-owners—in relation to the respective amounts paid by

them. This information should prove helpful in adjusting inequalities that may be shown to exist.

In summarizing, the results of the Inventory will supply information whereby it will be possible to select roads on a basis of relative property service; the Traffic data will aid in the determination of the selection of the roads on a traffic service basis and will be further helpful in selecting those roads to be constructed for light traffic as distinguished from those to serve heavy traffic; and the Financial Study will determine the extent to which the highway program may go to the end that there will be built no greater mileage than the state can economically own and maintain.

At this stage of the investigation it is difficult to come to any definite conclusion as to what will be required to put the highway system in condition that will again place Maryland at the top of the column of well-roaded states. That the system, as at present, is antiquated and inadequate is quite apparent. The State system comprises some 3,936 miles of road and our studies so far seem to indicate that at least 25% of this mileage must receive prompt treatment, due to obsolescence along lines of alignment, grades, surface width and condition.

MR. LINTON: Is there any discussion from the floor on this road problem, or any resolutions to be presented now?

Before we have the presentation of the medals, I would like to call upon Dr. Symons for a talk at this time.

DR. T. B. SYMONS: Mr. Chairman and friends, this is quite sudden. I think that we could take considerable inspiration from what we have heard this afternoon, particularly from Mr. Cooke's address in connection with the development of rural electrification. I would like to say that we have made more progress than was indicated in his address, because we first inaugurated the National Rural Electric Project, and that proved to be some development, and then during the past two years our specialists, in cooperation with our good women as well as with farm organizations, have done much to arouse the rural people to the importance of electricity. Our organization has had active cooperation from the utilities of the State, in some sections more than others, in the development of this useful addition to rural life.

We have worked with the R. E. A., so far as they could help us. I was just talking with an earnest farmer from Southern Maryland who is interested in the development of electrification in the farming sections—in Charles County and St. Mary's County, and other sections on the Eastern Shore. I think the fact that the Chesapeake Bay divides us, from the electrification standpoint, has been somewhat of a handicap, but, with the help of the R. E. A., the use of electricity will be increased throughout that section. There is not any doubt that the work of the R. E. A. has been a great incentive to all the

States throughout the Union, Maryland included, towards reducing rates, and granting extensions—getting a reduction from 10 to 42 per cent in Maryland, I think. I have been on a committee with the State Grange for a number of years in connection with that rate situation with the public utilities, and they have always given our farmers a hearing. You know what was accomplished with the telephone reductions, which farmers fought for for a long while. That reduction this past year has amounted to hundreds of thousands of dollars.

My policy, and I think the policy of most of the farm organizations in this State is to cooperate, and we will cooperate with all agencies for this purpose. I think we can all agree with Mr. Wise's report that the farmers have gotten greater cooperation this past year than ever before in the soil conservation matter. Your organization and the State Grange have a combined force now of 15,000 farmers, more than they ever had before; we sit together in a common cause, and I hope that each farmer will realize that in the future the great hope in all activities for the best interest of all is in greater cooperation, one with the other.

I want to bring the greetings of our County Agents and the Extension Service as a whole. I want to say that no greater cooperation could be expected than the farmers have given our forces, as we tried to do our bit in serving the interests of agriculture. I think the development this past year in bringing the cooperatives to cooperate is an advance, and I hope we will all see the fruits of cooperative effort throughout this region. When I think of the meetings in the days of yore, when I think of the great problems now before the farm organizations and the farm women, it makes us realize that we have gone far, but we have much farther still to go towards the great things that farm organizations can do. I was hoping that Mr. Cooke would tell us something of his achievements in connection with the soil conservation of this country. He made a most excellent address at Houston. He has some very fundamental thoughts in the development of the control of water. When I think of our areas on the Eastern Shore last year, the strawberries, the money lost, I think in terms of trying to hold some of our water as well as our money. I think the discussion at our conference yesterday at College Park showed that this soil erosion matter should have very great interest to every farmer in this room. When we think of passing the farm over to our boys or to our young folks who may follow us, it is a big question—we would like to feel that we are passing it over in better shape than it was passed to us. I certainly hope that this organization will really take up the problem of better land use in our State. The experts tell us that 10,000 acres are lost by soil erosion. We learn in some of these sections where these lands have been purchased from the government. We must go into that matter more.

We have some of the most attractive area in the east, and we must look to the development of that area in our midst.

So, my friends, I think we have much for encouragement, much incentive for greater effort. There never was a time when farming was more attractive to the young as well as the old.

I thank you, Mr. Chairman.

MR. LINTON: I see my good friend of the State Grange, Mr. Roy Brookes, down there, and I would like to ask him to greet you.

MR. BROOKES: I am very happy to greet the members of the Farm Bureau in their session today. I would like to add a word to what Dr. Symons has said relative to Dr. Cooke's remarks as to the rural electrification committee. In company with Mr. Nuttle, Mr. Wise and Mr. Zimmerman, of the State Grange Committee and the members of the Extension force, I served on that Committee for Maryland during the past two years. It was my good fortune to attend the meeting of the County agents, the home demonstration agents down at College Park this week. The last day I was there I heard a talk by a psychologist in which she explained that there were two methods of attacking any objective which she characterized as the direct and the indirect approach. I don't know how this could be better illustrated than in this matter of rural electrification, in Maryland. She said there were many times by which you might be able to place yourself in a position where not only would the objective not be gained, but that it might be lost, and those of you who have read the most talked about book of the year, "Gone with the Wind," noted the account of Sherman when he attacked and retreated and attacked and retreated—realize that the indirect approach really is a good method of procedure, and we have found that our indirect approach has been the means of lowering some rates, extending some lines of electricity, and if I may say so, keeping the wholehearted friendship of the utilities, and so our efforts have not been in vain.

As long as I have been introduced to you for a greeting I would like to take this opportunity to inject one other thought into the deliberations of this body of people. The United States of America for the last four or five years has been trying to come out of a serious depression, during which people were without money, when laboring men were without jobs, and we have brought ourselves to believe that in 1936 we are approaching the passage of the bad times that have been with us, and yet it is a serious thing to think that a small group of men are able to disrupt a whole group of satisfied workers—I refer to the General Motors strike—so that 70,000 men who had good jobs and who were well paid, and who were satisfied with their work and did not want to strike, can be forced out by a few people—and they tell us that still more will go out, and try to take the jobs away from those people. I don't know that there is anything that the Farm Bureau or the Grange can do about that. But I think it is a serious

thing for the tax-paying group to think about. It will certainly mean more people on relief. It is a serious thing for us to consider.

I thank you, Mr. Linton, for this opportunity to speak to the members of this great organization, many of whom also belong to the organization that I represent. I wish for you a most successful conference, and I hope by the combined efforts of the Grange and of the Farm Bureau, the agricultural people of the State of Maryland can work unanimously for the growth of a better spirit of brotherhood and a higher state of intelligent agriculture, and that as the years go by Maryland, which is the key State in the East, may really become in reality the key State of the whole nation.

MR. LINTON: We will now have the presentation of the medals of the Vocational Agricultural Boys.

(*Presentation*)

(*See list of winners on pages 46 and 47*)

MR. LINTON: This concludes our program this afternoon. Thank you for your patience and attendance, and the meeting now stands adjourned.

LIST OF WINNERS IN THE MARYLAND FARM BUREAU-F. F. A. PROJECT CONTESTS FOR 1935-36

President Nuttle presented the medals to the following winners of the awards:

Project	Rank	Contestant	High School	Award	
Beef	First	Austin L. Huffer	Middletown	Gold	F.F.A. Medal
	Second	Edwin Barnes	Boonsboro	Silver	F.F.A. Medal
	Third				
Corn	First	Harold Roderuck	Walkersville	Gold	F.F.A. Medal
	Second	Ray E. Valentine	Emmitsburg	Silver	F.F.A. Medal
	Third	Clifford Hutzell	Boonsboro	Bronze	F.F.A. Medal
Dairy	Balto. Shed				
	First	Francis H. Barnes	Liberty	Gold	F.F.A. Medal
	Second	Lester S. Wogoman	Thurmont	Silver	F.F.A. Medal
	Third	Richard Reynolds	Liberty	Bronze	F.F.A. Medal
Dairy	Phila. Shed				
	First	Carroll L. Horine	Middletown	Gold	F.F.A. Medal
	Second	Erle P. Talbert	Boonsboro	Silver	F.F.A. Medal
	Third	Bruce Brandenburg	Middletown	Bronze	F.F.A. Medal
Dairy	Wash. Shed				
	First	Carl Stephens	Damascus	Gold	F.F.A. Medal
	Second	Harold Roderuck	Walkersville	Silver	F.F.A. Medal
	Third	Edgar A. VanFossen, Jr.	Walkersville	Bronze	F.F.A. Medal
Potato	First	Harley M. Wildesen	Oakland	Gold	F.F.A. Medal
	Second	Wade Frazee	Oakland	Silver	F.F.A. Medal
	Third	John Eccard	Middletown	Bronze	F.F.A. Medal
Poultry	First	Clark O. Nicholson	Poolesville	Gold	F.F.A. Medal
	Second	Robert S. Delander	Middletown	Silver	F.F.A. Medal
	Third	Robert K. Poole	Frederick	Bronze	F.F.A. Medal

Sheep	First	G. Eugene Day	Middletown	Gold	F.F.A. Medal
	Second	Ralph V. Baker	Oakland	Silver	F.F.A. Medal
	Third	Shannon Bros.	Poolesville	Bronze	F.F.A. Medal
Sweet Corn	First	Lloyd Grubb	Poolesville	Gold	F.F.A. Medal
	Second	Edgar A. VanFossen, Jr.	Walkersville	Silver	F.F.A. Medal
	Third	Frank L. Bentz, Jr.	Boonsboro	Bronze	F.F.A. Medal
Swine	First	Mason Butler	Poolesville	Gold	F.F.A. Medal
	Second	Amos R. Keller	Middletown	Silver	F.F.A. Medal
	Third	Francis H. Barnes	Liberty	Bronze	F.F.A. Medal
Tobacco	First	J. Owens Higdon	Hughesville	Gold	F.F.A. Medal
	Second	Edward Jackson	Hughesville	Silver	F.F.A. Medal
	Third	Dick Steffens	Hughesville	Bronze	F.F.A. Medal
Tomato	First	Roosevelt Gilardi	Boonsboro	Gold	F.F.A. Medal
	Second	Ralph J. Russell	Hurlock	Silver	F.F.A. Medal
	Third	Harold Thomas	Hurlock	Bronze	F.F.A. Medal
Truck	First	Thomas Draper	Middletown	Gold	F.F.A. Medal
	Second	Chas. J. MacCartee, Jr.	Clarksville	Silver	F.F.A. Medal
	Third	Reese Biddinger	Liberty	Bronze	F.F.A. Medal
Miscellaneous	First (Horse)	Rudelle Crum	Walkersville	Gold	F.F.A. Medal

THURSDAY, JANUARY 14TH

GENERAL SESSION

MR. NUTTLE: It is a pleasure to present as your presiding officer this afternoon one of the old war horses of the Maryland Farm Bureau. He is a man in whose judgment I have the utmost confidence; he has been a member of our Executive Committee for years, a real leader in Maryland. I present to you as your presiding officer this afternoon, Mr. D. B. McDowell, President of the Cecil County Farm Bureau.

MR. MCDOWELL: I wish to thank you, Mr. Nuttle, for the introduction you gave me. Now, first on the program I want to say that we have with us the oldest President, Mr. Cohill. We would like him to stand so you can all see him. He was the first President of the Maryland Farm Bureau. He is eighty some years old, and he holds his age well. (Mr. Cohill rose and bowed.)

We also have with us our first Secretary, Mr. Melvin M. Stewart. Please rise, Mr. Stewart. (Mr. Stewart rose.)

While we are introducing these gentlemen, I also want to introduce our past President, Mr. Charles Cockey, of Baltimore County. (Mr. Cockey rose and bowed.)

Now, we have first on our program the report of the Credentials Committee, Mr. P. C. Turner.

Mr. Turner presented the report of the Credentials Committee as follows:

REPORT OF CREDENTIALS COMMITTEE
MARYLAND FARM BUREAU, INC.

County	Paid-up Members	Number of Directors	Number of Delegates
Anne Arundel	53	1	1
Baltimore	438	1	9
Calvert	50	1	1
Caroline	208	1	4
Carroll	176	1	4
Cecil	96	1	2
Charles	181	1	4
Dorchester	100	1	2
Frederick	496	1	10
Harford	239	1	5
Howard	52	1	1
Kent	220	1	4
Montgomery	199	1	4
Prince George's	178	1	4
Queen Anne	198	1	4
Somerset	96	1	2
Talbot	178	1	4
Washington	152	1	3
Wicomico	212	1	4
Worcester	66	1	1
Totals	3,588	20	73
Maryland Stockmen's Association		1	1
Maryland State Horticultural Society		1	1
Maryland State Poultry Council		1	3
Maryland Cooperative Milk Producers, Inc.		1	3
Maryland Tobacco Growers Association		1	3
Hillsboro-Queen Anne Corporation		1	1
Maryland Vegetable Growers' Association		1	1
Maryland State Beekeepers Association		1	1
Maryland Crop Improvement Association		1	1
The Agricultural Corporation of Maryland		1	3
Maryland State Horsebreeders' Association		1	1

Respectfully submitted,

P. C. TURNER, Chairman.
J. W. LORD.
JOHN SMITH.
A. K. AUSTIN.
FRANCIS SHILLINGER.

MR. MCDOWELL: I guess most of you boys know where you are placed, and when the meeting opens tomorrow morning, we would like to see you in your places.

Mr. Turner moved the adoption of the report of the Credentials Committee; Mr. Wilbert Smith seconded the motion and it was carried.

MR. MCDOWELL: This afternoon we have two or three speakers. The first speaker is a lady speaker. I felt that I could not do that lady justice, and so I have asked our Home and Community Chairman, Mrs. Roy Weagley, of Washington County, to introduce the next speaker.

MRS. WEAGLEY: Mr. Chairman and friends: Most of you probably know that the group of Associated Women of the American Farm Bureau is divided into four regions; each region is a part of the National Board. The Southern Region, of which Maryland is a part, boasts of having the youngest and most capable Director on that Board. At Pasadena it was my privilege to be at the meeting when Mrs. Giles was nominated for re-election, and the next day Mrs. Giles made me extremely happy when she accepted the invitation to come to Baltimore and speak to us at our annual meeting. I doubt very much if Mr. Giles heard the complimentary remarks made by the three men from Maryland or he would probably have accompanied Mrs. Giles on this trip. I am not going to repeat those compliments because my husband was one of those three—shall I say wise men—only one of them was Wise by name, but I think all of them are wise by nature, and after you have heard Mrs. Giles speak, I know you will agree with those three wise men from Maryland, even if some of you are not far enough from home to safely express yourselves. It affords me great pleasure at this time to present Mrs. J. D. Giles, Director for the Southern Region, of Alabama, who will speak on "Forward Planning."

FORWARD PLANNING

By MRS. J. D. GILES

Thank you, Mr. Chairman, and greetings, members of Maryland Farm Bureau, and guests. Indeed it is a happy privilege to bring you greetings in the first days of the New Year, a New Year of forward planning, a New Year of opportunities. May this New Year, 1937, bring you many happy surprises, plenty of work and opportunities for serious thinking and study, keeping in mind that subject which is of vital interest to all: Organized Agriculture. Let us hope for the New Year that every Farm Bureau member will stand squarely on his own feet, with chin up ready to face facts, and with eyes looking beyond tomorrow, so that we cannot help but march triumphantly forward to our great goal, Equality for Agriculture. I am glad to march in this great army of farm people.

I am glad that I am a farm woman. I was reared on the farm and taught from childhood to love the long hours and hard work that agriculture demands, because after all these long hours are spent and the work is done with live and growing things. I do not believe that rural people as a whole are seeking an easy life and short working hours as much as they are seeking an opportunity to help bring the standards of farming up to that of other occupations.

I believe that there are three things that rural people hope for above all else. They are, first, better educational facilities; second, adequate rural legislation; and, third, a higher standard of rural living conditions. I placed education first, because it is through our educational facilities that we develop leadership, fellowship, cooperation, community service, thrift and the ability to work and play together. By adequate rural legislation, I mean laws that will enable the farm family to receive a fair share of the consumer's dollar; I do not mean laws which will enable the farmer to get something for nothing, but legislation which will enable him to have something after he has worked and toiled efficiently for it.

Sometimes, I think the reason farm people have not taken greater interest in local, state, and national affairs is because they have not had time to stop and think about them. The margin of profit in farming has often been so small that the farmers have been too busy trying to make ends meet, but, thanks to farm organization, our Extension Service and other adult educational agencies, farm people are making policies to meet their needs.

As a farm woman, I am glad to say that I belong to two adult educational organizations, the Home Demonstration group and the Farm Bureau. I belong to the Home Demonstration group because I consider it the best adult educational agency in existence for farm people. The United States Department of Agriculture requires our Extension leaders to be the highest type of citizenry, trained in their particular line of endeavor; they are a mighty force in helping with our forward planning program, a program which will be a great power and influence for generations to come. And I belong to the Farm Bureau because it is the most sane, conservative and broadest in its program of any farm organization, and it is our duty to keep it so.

If a study were made of the history and need of organization, it would take us back many years in the history of our race. Primitive man and animals organized long ago—men in clans, and animals in packs. As civilization progressed, we find these organizations progressed and people divided into races and organized into governments, and so on to our present time where we find organization in our governments to promote and protect the individual groups. All down through the ages this progress has been brought about by the forward

planning of some individual, groups, or both, with two dominant thoughts or reasons in mind; first, protection and security, and, second, because of the fact that people realize that in union there is strength.

Judging from the early history of the race, organization seems to have been more of an instinct, as self-preservation was the first law of nature. It has been said truly that where "There is no vision the people perish." So, of necessity, organizations have come for the purpose of trying to visualize the future and to make things more secure. We can profit by the experiences of the past in order that a more intellectual and beneficial course might be followed, realizing that in the multitude of counsel there is strength and wisdom.

Eighteen years ago the forward planning and vision of a small group of agricultural leaders organized the American Farm Bureau Federation. Today, with its affiliated State and County units, it is the greatest organized force for American agriculture in existence. This federation was organized for the purpose of protection to agriculture and to plan a wise and intelligent vision of leadership for our future course and welfare.

American agriculture stands today at the threshold of a new era. Behind it are inerasable experiences; ahead of us is the dawn of a new day. The forward planning of our National Leaders kindles within us the sparks of confidence, their radiant energy generates optimism. The spirit and growth of cooperation marches on toward greater accomplishments so that some day, not so long off in the future, the philosophy and spirit of organized agriculture will permeate the hearts and minds of all America.

We need the rubbing of shoulder to shoulder with other people in order to get vision and inspiration to help combat our common everyday problems. We need the organized man power and woman power on every farm and hamlet in our nation to pool their visions and resources. Women as homemakers are partners in Farm Bureau, and are therefore interested in all problems that affect the farm and farm people, for farming and homemaking are as much a profession as any other line of endeavor. Theirs is the sacred duty of directing the home life, which forms the character of the next generation. They are the mighty forces in setting the highest ideals of home life; likewise, they can help in molding public opinion as to the social and also the economic needs of agriculture. Men as a rule are so engrossed with the economics of the organization I am sometimes reminded of the story of a young couple who were out for their first walk with the new baby in the new baby carriage. As they strolled down the street the enthusiastic young mother turned to her husband and said, "George, isn't it wonderful to think that that belongs to us," and George replied, "Yes, dear; and to think that we got it down at

Ginsberg's for only $7.98." The mother was thinking of the baby and the father was thinking of the baby carriage. As farm people, we too split up into those that look at the baby and those that look at the carriage; so, you see, we do need the wise planning of both men and women to keep the proper balance for organized agriculture.

I hope that you Maryland farm leaders will give sober consideration to these thoughts and make a larger place in your organization for the women. Why not give them a major place in the job of organization and education; they want to help with the forward planning; they want to be a part in helping to reach the goal. There are two words that have a very similar sound; they are the words "cog" and "clog." A "cog" is that piece of machinery which dovetails in with other parts of the machine to speed up and make more efficient the operation. A "clog" is an impediment that blocks, destroys or hinders the operation of the machine. Rural womanhood wants to be a cog in the great agricultural machine; they want to be an integral part in the vast army who are working together to solve our mutual problems.

The goal of forward planning is parity prices, equal educational advantages, low interest rates, cooperative organizations, American markets for American farmers, enlarged Foreign markets, honest money and a prosperous nation founded upon a prosperous agriculture. If we reach this goal, we must mobilize the rural man power and woman power and march forward step by step, arm in arm, under the green and gold banner of the American Farm Bureau Federation.

Our National, State and County leaders are doing their bit of forward planning; they have made possible for the farm people of this country a great organization with a broad constructive program, —aggressive in its demands for decisive action to meet emergencies, —constructive in its approach to all problems of agriculture,—conservative in that it will preserve the ideals and institutions that every American holds dear. One of the most significant things that impressed me at the eighteenth annual meeting of the American Farm Bureau Federation, held in Pasadena, California, last month, was the fine spirit of cooperation. There was no sectionalism, no North, no South, no East, no West, but leaders from all over the nation, all in unison, planning the policies that will best serve the nation as a whole. It reminded me of the blessed words of the Master, when he said, "A new commandment I give unto you that ye love one another." And I'm wondering if we as individuals, back in our community, are helping to promote this broad and constructive program to improve community life and raise the standard of living for all the farm families of the nation.

MR. MCDOWELL: I think we all feel grateful to Mrs. Giles for this fine talk. As Mrs. Weagley said, after the trip to Pasadena there

were three wise men,—I would not wonder if there were one hundred or more after that talk.

Now, Mr. Wise, our Secretary, has a few announcements, and then I am going to ask him to introduce the next speaker.

MR. WISE: It has been a pleasure for me to work with our next speaker, Mr. Harvey Hull, President of the Indiana Cooperatives; President of the United Cooperatives, a successor to the Farm Bureau Oil Company, which has its own plant and they marketed one million gallons of lubricating oil in Indiana last fall. He is also President of the National Cooperatives, with a membership in 22 States, reaching from Washington on the West Coast to Texas on the South, and in the East to Maryland. As we are members of this organization, it has our membership also. It is a pleasure to introduce to you, Harvey Hull, President of the United Cooperatives.

ADDRESS

By HARVEY HULL
President of the United Cooperatives

Mr. Chairman, I really think it is too bad for me to have to stand before you folks and spoil that wonderful introduction. I can assure you that not everybody here feels so impressed with my personality. Just before I came in the door a while ago, I had a visit with one of your folks here. He asked me what County I came from. I said I came here from Indiana. "Oh, yes," he says, "that is where John Dillinger came from." I assume that is about the opinion that people have about Indiana. I want to assure you that we are not all John Dillingers. I am just as sure though that my intent here at my first visit among you people today is just as selfish as any visit John Dillinger ever made. I don't know whether he ever came to Maryland or not. He went to every other place. If he ever did come here, however, it is a selfishness, I trust, of a different nature. It is a selfishness that does not altogether disregard that new command we were just hearing about; it is a selfishness that does not involve the exploitation of the folks in Maryland or anywhere else, but it is a selfishness that recognizes that it is good for all of us to get together and recognize our common problems and help one another to solve them. That is the kind of service I am bringing you. We may benefit by knowing you better. I am ready to announce that I have gained a lot from the little visit we have had so far.

My own position has been rather exaggerated. It has only been brought about by the fact that I have had personal inclination to want to work with other folks, with other groups, and to expand the size of our activities that they thereby might render a better service to our people. It is only with that spirit that I want to visit with you for the next few minutes this afternoon.

We farmers in Indiana and the Middle West, and I suspect also the farmers in the East, have not been getting a square deal; we have been talking a lot about that in agriculture, about this thing called parity. For a number of years we have felt somehow or other that we are not getting a fair deal out of the business world for some cause or other; we were not getting our share of the National wealth. We have done a lot of complaining about that thing; we have done about everything that we could think of, going to the Government, asking for help. Right here this afternoon Mrs. Giles has been telling us these things. I am here to help the farmers of America.

I want to call your attention to another group of Americans 'way out in the central west; we look upon the eastern seaboard as the birthplace of American Democracy, the place where our forefathers fought and bled and died in order that they might get fair play in governmental affairs. Before they started that conflict for years and years they wrote letters to the King, asking for fair treatment. They begged and plead for representation that would in some way match up with the taxation that was being imposed upon them. They used every other expedient in the world to try to get governmental relief, and finally after striving in every possible way, they came to the conclusion if they were going to get fair play in government, the thing to do was to govern themselves. They gave up all hope of a distinterested government, someone running their government that was not vitally and personally interested in their own welfare, and so they declared independence, and set about the task of setting up our American Democracy.

I am wondering sometimes if we cannot take a little leaf out of their notebook. Just as those people, after complaining about unfair treatment at the hands of government, and complaining of unfair treatment at the hands of business, just as they finally decided the way to solve their problem was to run it themselves, it is my guess before we finally solve our business problems we will solve them in exactly the same way,—by taking over the operation of our own business affairs and setting up an American business democracy, by operating that institution, putting the control of it in the hands of the people that are to be served by that institution, who have no other motive involved except the motive of serving themselves in the very best possible way.

So, that is what we want to talk about for just a little while this afternoon,—the setting up of our own business institutions for the purpose of helping to bring about better conditions on the farm, with better standards of living that we have been hearing about.

After all, the foundation of it all and the purpose of all this are the things that we are trying to do today.

I want to say again that I do not want anyone to go from here

with the thought that I am depreciating the things that may be done by the Government, but let's keep this thing in mind,—that only 24% of the population of the United States lives on the farm, and, even if we got all of our farmers voting together,—and maybe you do down here in Maryland, but we have not been quite as fortunate, we have not come to that point of civilization in Indiana. I am pretty sure they have down South, but we have not quite gotten to that point in Indiana. Even if we all voted together, we still would have to get more votes than farmers' votes with us to keep a law on the statute books than we could get out of our own ranks. So, don't let's depend entirely upon a system of saving agriculture that will rely upon governmental activity. Let's see if we cannot figure it out some way within our own control, that we ourselves can set up an administration to help ourselves.

I heard a fellow the other day express the thing in a rather unbeautiful manner. He was talking about farm relief. He said, "Farm relief is all right as far as it goes." He said, "When you get the itch, you want to scratch, but the scratching is not going to cure the trouble; when you get through scratching you still have just as much itch." I suppose you think that is not a very nice expression, but at least it expresses in a rather crude way what one person's opinion of that type of relief activity was. Now, don't let's belittle that from their standpoint. I guess there is a place for relief programs. I am not arguing against them. What I am trying to develop is for us to try to think out something more substantial as a foundation to set under the financial institutions of American agriculture, something a little more substantial and sound and permanent than these farm relief activities have been.

Now, it has been my pleasure to visit some of the cooperating institutions, both marketing and buying, in the Scandinavian countries. I have seen over there the great work they were doing. When I go through some of our plants, I think of those Danish places. They get a higher price than we can get for our American products, and why? Because they have imposed certain better restrictions as to quality and production than we have, and that has built up for them a better market, and they are all benefitting as a result of that thing. I have seen those marketing restrictions over there, and today they have gone a long way toward building a parity condition for Danish farmers.

We began in Indiana about the time you did. I am not very proud of the first part I had in that matter. As a matter of fact, I am quite ashamed of it today, and I would not tell this story in Indiana, but I believe I am going to tell it here, not to boast, but just to show how foolish people can seem sometimes. In the spring of 1921, you recall that things got pretty hard with us. I was farming in northern

Indiana. I had five carloads of cattle when the bottom fell out of the market completely and I lost that entire year's work. The money had been borrowed from the bank with which to purchase that livestock. My entire selling price was not enough to pay all the loan in the bank. I happened at that time to be the district head of the Indiana Farm Bureau. We called a meeting; we wanted to try to justify our membership, but we did not know what to do. Keep in mind that I was chairman of the meeting and could not enter into the discussion. They say the first law of human nature is self-preservation, and the second is passing the buck, and that is what I am doing this afternoon. Some fellow brought up the price of fertilizer; it was 16% more on super-phosphate, selling $14.00 a ton more. But what could you do about it? This fellow says, "I tell you what the laboring people do. They call a strike." So he made a motion that we call a strike and refuse to buy fertilizer until the price came down to a reasonable amount. I put the motion and it was carried, and we sent copies of that all over the place, and then we waited for the price to come down. We waited through February and March. People were getting ready to plant. By the first of May the price was still up there, and we could see some of our members slipping out and buying, this and that fellow, and the price was still the same. Along about that time someone,—I think our former President, John Brown, a little more careful than the rest of them, decided that the way to handle that problem was to get some fertilizer and bring it in there and sell it. They went to Alabama and they bought about 5,000 tons of fertilizer and brought it up there. Nobody knew what bad stuff that was, but they began to sell it for $20.00 instead of $34.00. As sure as I stand here, within seven days of the time they first began to sell, the price in Indiana came down $14.00, and they sold for $20.00 instead of $34.00. From that day to this we have bought our fertilizer in Indiana at a parity price. Now, you have gone farther than that. You have gone so far in this territory that your organizations have taken over the fertilizer factory. You are manufacturing your own fertilizer today and if you get parity prices or not, it will be you, yourself, who get it. You have solved that problem, and, after all, who ever paid for a fertilizer plant except the farmer. You pay for it when you buy your ton of fertilizer at $34.00. You pay about $14.00 more than you should.

Gentlemen, we got our own business. How do I know that? Well, it had that effect in Indiana. Three years ago the price in Illinois was still $4.00 a ton higher than the Indiana price, and they came over to Indiana for their fertilizer, and the whole price in Illinois dropped to the same level we had in Indiana. The United States Senate itself ordered the Federal Trade Commission to make an investigation back in 1923. They sent a fellow out there. He came up in my room in Indiana. He scared the life out of me. We had been making the

statement around that we were the cause of the drop in the fertilizer price, and he said, "I understand you have been making these claims, and we want to know about it." Well, we gave him all the information. I looked him over, and talked to him in a nice soft tone of voice. These fellows from Washington scare us when they come to Indiana, and he made that investigation and he came back and made his report, and today you can get that report in which they said that the cooperative buying of fertilizer had been the principal cause of reduction of the price. You can see that report; that is not a matter of personal opinion as far as I am concerned; it is a matter of record.

Now, you say that is all right, that is just an isolated case. I am going to make the statement this afternoon, and put it where you will, in any line of activity that should become an important factor in the distribution of that commodity, you can do the same thing. I am going to go a step further. Next to fertilizer, the largest commodity we have to buy is petroleum. We started handling petroleum products in 1928. That year we shipped in a carload of gasoline at 7½ cents, —that was the difference between the cost of that gasoline delivered at the farm. We went ahead and set up our plants,—such a beautiful margin our folks pay for that whole product. We went on until we narrowed that down to 5½ cents. At the time the NRA codes came in, a couple of years ago, you will recall that one of the first codes to be brought out for a hearing was the petroleum code. We were there. The first copy that was written up by the industry they wrote in just about these words. No person, firm or corporation shall be permitted to pay any patronage dividends on petroleum products. Well, of course, we were a little bit alarmed. We did not know what to think about that. We took that up with General Johnson, and he swore a little, and then we took a copy of our petition directly to the President, and President Roosevelt himself signed an order that no provision of any kind should deny the privilege of paying patronage dividends by any bona fide and legitimate cooperative. And armed with that we had another meeting of the Petroleum Code Committee.

There was quite a lot of conversation in that second meeting, and I am going to say that nine-tenths of all the discussion was built around the industry of petroleum products. We felt flattered. We never realized we were that important. Finally, after they had been talking it over for quite a while, one of our good friends from the Deep Rock Oil Company got up before the group and said—I can't quite use his language this afternoon—but he said the purpose of these codes is to allow the manufacturer to make money, and these blankety-blank cooperatives have come in and have paid certain patronage dividends until they have forced us to narrow our margin to the point where we cannot make as much money as we ought to. If you are going to let them go ahead and pay those patronage dividends, we

cannot raise our price, but here is the thing we will do,—we will cut the price on tank car lots, but leave the filling station prices where they are; we will make our money out of the filling stations, and then these fellows cannot pay their patronage dividends. Well, they did. There is one beautiful thing about that story. The industry itself openly admitted that the cause of the price reduction was the co-operative distribution. They said that was the reason they were doing it. We went back home. We had already gotten a two-cent reduction, and after that we got this other two-cent cut, and the price of tank gasoline was cut two cents below the price of filling stations. In Indiana alone the farmers bought 100,000,000 gallons a year. That one thing amounts to about $4,000,000 a year in reduction on cost of gasoline. Not only does it make that price reduction on our own business; it has made the same price reduction, regardless of where they buy that petroleum product. That has brought the price of gasoline down to the point where we are buying our gasoline at a parity price; we are buying it at a lower price than we bought gasoline before the war.

Now, you are an integral part of this organization; you have a part ownership in it. It has also set up its own lubricating oil factory. We found out at that same time in 1928 that there was a lot of difference in lubricating oil. They told us that in the Bureau of Standards in Washington and at Purdue University. The life of it could be lengthened by at least 25% if the quality were better. That was too much temptation for the manufacturer to graft a little by selling inferior products, so we went to the Legislature as we generally do when we are in a tight place, and we asked them to pass a law to compel the printing of specifications on the content of that lubricating oil. It happened that quite a little of the petroleum industry in Northern Indiana opposed it, and to make a long story short, we did not get a law through, but it made our Board of Directors think. It was quite important if 25% of the money spent for lubricating oil could be saved, and so they planned to have their own factory; they put in their own plant, and you are a part of that now. It was not very long before we were able to let our farmers buy an oil with the same specifications as the Quaker State for about 65 cents a gallon, and you never heard such a thing as buying an oil of that quality for less than $1.00 a gallon. On top of that, we have saved enough out of that 65 cents a gallon to build and pay for that plant and return to our members about three times the amount of investment. And the plant in the way of cash dividends will pay you back. We are doing our own job and getting that oil out at a parity price, our own institution. We solved that problem.

I had a conversation with Alex. Legge, former President of the International Harvester Company, one day. Mr. Legge was talking about this matter, and he says, "I do hope you can build this coopera-

tive business to the point where it can some day take over the distribution of farm machinery." "Why," I said, "Mr. Legge, you surprise me. I thought all your companies were afraid of that." "Afraid of it," he said, "afraid of it? No, indeed. The thing is that with our present system of distribution we are paying,—we have five or six big manufacturing plants of farm machinery, and we do not sell farm machinery, we have to build up a selling force to take the business away from the other fellow, and we have to pay more for that than for manufacturing the machinery." Now, think that over. When we want to buy machinery, instead of grouping our orders and giving them to somebody, to our own institution, where we are making our own machinery, we have to pay for all this sales cost. The cost is more today to sell farm machinery than it costs to buy the materials and make that machinery. If people would ever get to the place where they would stick together in a general way about that sales problem we could make a reduction in the cost of distribution of about 35%. Now, just take your pencil and go home and figure that out; 35% more is what you have to pay for your farm machinery because of this sales cost. That is one of the things that I wanted to bring up. Indiana is not big enough to do that job. All of our groups together from Maryland to the State of Washington, if they would all get together with a program that we can all stick to—can some day solve that problem too, and no Congress, not even the Supreme Court, is going to keep us from it.

Now, there are two ways to this parity problem. First, about the price, and then there is a good deal to be done in the way of the quality of the thing we buy. When industry buys materials to go into manufacture, it buys those materials on specifications and on known quality. You have already done that on your lubricating oil; you are getting oil of known specifications. If we get on the same basis that industry is, we will have gone a long way. But, we want to go a little further with this thing. Just recently we realized that our folks out in Indiana use a lot of tractors; they do a lot of dairy farming. About three years ago, we had several discussions along the line of farm business, of their developing that to the effect that the tractors we are using are out of date. Manufacturers have known for five years that it was no more economy to use a low capacity motor in a tractor than it was in an automobile, and yet four or five years ago they began to put these higher and higher capacity motors in the automobiles. About two years ago we hired an engineer on our own. This is the larger group of which you are a member; I don't know whether you realize that you are taking part in the program, but you are really a part of it. Well, we hired this engineer, one of the best in America, and we put him to work.

He was the first engineer that ever went on the job of developing a tractor,—I was going to say, and to use it. They have been develop-

ing the tractors under the commands and orders of the people that are going to use that tractor, but he was the first man that has gone after the job with his hands free, not being under the control of some sales organization. The other men knew better in a lot of cases, but they had to develop a type of motor and equipment that the sales department told them to develop. That might be the best kind for the sales department, but not for the farmer. They wanted something that would use cheaper fuel, and they thought that would appeal to the farmer, and they were pretty near right in that guess, but in this case the only motive back of this man was to develop the most economical thing that we could put up; so we came out a year or two ago with this cooperative tractor. The closest one that I know of in this territory, we have some 300 of them on hand to sell in Indiana, will be up in Harrisburg at the show next week, and if any of you folks get a chance to see it, I wish you would. We sent a couple of boys out at Purdue up there to drive that tractor around. They have driven those tractors over two hundred miles on the road; it can be driven fifty miles an hour; it can take the place of a truck. We were afraid at first that the other companies would go into the same field, but they did not. It is not that we know any more than the other fellow; not that our engineer knew any more; it was because he was working for the people that are going to use the tractor. Let's get that straight; there is all the difference in the world. The other fellow wanted to make the most money out of the manufacture of the tractor, but we only wanted to use the tractor ourselves.

So, there is no end to the things that you can do in this matter of parity of price; it includes the control of specifications and quality as well as the price. Make your own decisions in both of those things.

There are two or three things that I want to call to your attention; I did not come here to preach. I think that you realize that before we can do these things we have to learn to work together, to work out the program with each other and go down the road together.

You have a splendid organization here, I am sure, from the standpoint of developing initiative and responsibility out among your folks. I am particularly interested in this development of County associations that you have here. We want the same type of organization in Indiana; that is the foundation upon which we have built our central organization to teach them all how to work together. This thing of democracy, whether in business or government, is just as good as the individuals connected with it, just as wise a government as the folks that do the voting. After all, it means the people are going to run their own business. The people are not yet ready to do the best job in the world. They must realize that they have a long way to go. They must develop the leadership,—and the followers,—must develop an intelligent approach to the business activities that may be called in question.

One thing that has scared us in a lot of places has been the danger of cooperatives coming into open competition with one another; we can go too far with that sort of thing, and it would not be to our advantage. We cannot afford to let that thing happen, and it will not happen if we let that spirit of brotherhood control us. There are several places in the United States today where the good work of the cooperatives is being undermined because of the competition between the cooperatives,—that is what the old line business has been trying to do all these years, that is the reason we are paying too much for farm machinery, because of the competition between the manufacturers. That is the reason gasoline has been so high.

I was impressed the other day when talking about filling stations; a little village out in Indiana with some 355 people living in it had five filling stations,—there was not enough money there to pay for more than one, and yet with all the five there was the competition. Out in California they made a definite program; they all got together on one; of course, it put two or three people out of business. But that filling station last year, 1935, distributed among its folks earnings amounting to $93,000 in cash after selling at the market price. Of course, as I say, two or three people were put out of business, but those people were just sitting around and waiting for gasoline business, and they might just as well be doing something else. But this one place returned to that community $93,000. That would build up the buying power of the whole population of that community. What does that mean? If I remember my economics course right, the teacher used to tell us this thing called "demand" is composed of two factors, the desire for the article, plus the ability to pay for that article. Those folks out in California may want bath tubs, electric fixtures, things that will raise the standing of the community, and they did not have the money to meet that demand, and now they have returned to them $93,000. If two or three other people were put out of the gasoline business, they might get into the business of selling electric supplies and bath tubs, or find other opportunties that may have existed, and thus it would be rendering a real service to them.

Now I am getting a little bit too rhetorical. But I want to bring those things in for this purpose. American industry is being unduly scared about the advance of this general cooperative program. I personally think that some of the motives back of this can be questioned. I wish we could get before them the whole truth of the matter, namely, that each and every business opportunity depends upon the welfare and the support of the community. If it is a prosperous community, there are plenty of opportunities in it; if the community itself is impoverished or the money drawn out of the rural sections be scattered too much, you impoverish this rural section. The want already exists, but you can only satisfy that want if you provide enough money to go back on the farm to buy the things they want. The im-

plement industry would not make money as long as the farmer could not buy machinery; the way to keep him buying enough machinery is to put enough money back on the farm. That is the thing you want to do.

Now, it has been a great pleasure to be here. I hope in our future development that you will not take all these statements of mine too seriously. I do not want to undermine business. I am not that kind of a fellow. I do want to build our own institutions, to increase our own business, and while we are doing that some other fellow will have to make adjustments. We have a common problem before us, and we want to follow that first command that you heard of a little while ago in the solution of this problem.

MR. MCDOWELL: From the attention that you gave the speaker, I know you were pleased with him. I noticed when he came up here he had some notes, but what he brought them up for I don't know because he never once looked at them.

Mr. Wise will now make some announcements.

Our next speaker this afternoon needs no introduction to this group of people. I think most of you have known him, our National representative at Washington, Mr. Chester H. Gray.

MR. GRAY: Mr. Chairman, President Nuttle, friends, you are all greatly pleased and instructed by that very fine talk that my friend of fifteen years or more made. I don't know how Harvey got along so well before he became acquainted with me, but he seems to have done pretty well by himself in the last fifteen years, and he has had a lot of experience which we can all profit by, listen to and put into practice along cooperative lines, and supplementing what he has said, before I swing into the subject which is on our minds this afternoon, may I say something in regard to cooperation,—that conversation Mr. Hull had with Alex. Legge, when they were speaking of marketing farm machinery cooperatively,—that may come in ten years from now, or twenty-five years from now. These things move slowly. Maybe Alex. Legge did not see as far into the future as some of the rest of us who have been in the field of the Farm Bureau work. These are things for us to look forward to in the cooperative field, and inasmuch as there is a direct connection between these things that we are doing,—whether it be in farm marketing, or in farm buying and National legislation,—let me say that many of the things which we are all doing in cooperation,—many of the things which we hope yet to do in cooperation are not legally possible to be done now, and had it not been that the Legislatures had helped us in the past, we would not have accomplished as much as we have. In Congress, when I started this work, we were hearing very little about relief to agriculture. We had certainly needed relief, but we had not had it. No one was going to Washington, so far as I know, with a single cure for agriculture; no one has come to Washington with a bill which he hoped to have written into law which is going to cure all agricultural ills.

Summary of Address of Chester H. Gray, Washington Representative, American Farm Bureau Federation,

At the Annual Meeting of the Maryland Farm Bureau, Inc., Lord Baltimore Hotel, Baltimore, Maryland, January 14, 1937.

"A FORWARD LOOK IN FARM LEGISLATION"

It is now realized that the States cannot immediately enact legislation which will supplement the Soil Conservation and Domestic Allotment Act. In that Act the States were given until January 1, 1938, to enact coordinating legislation. When it is realized that other federal aid activities have required more than ten years ordinarily for the federal and state governments to get into harmonious working relationships, it is evident that two years are inadequate in the case of the Soil Act. Consequently, it may be expected that one of the prominent farm projects at Washington will be to extend the time limit set in the original Act.

The nation is now aware, after 25 years of inattention to developments, that we have a tenancy problem. Maryland is one of the most fortunate in that the percentage of tenant-operated farms is not large enough to be alarming. This situation is generally true of the entire northeast part of the nation; but taking the nation as a whole, there is undoubtedly more than a drift towards tenancy. Reduced acreage of farm products, particularly in the South, as a result of continued efforts to balance production with consumption have aggravated the tenant problem. Efforts will be made at Washington this winter—bills have already been introduced—to aid in solving the tenant problem. These measures are very largely along the line of extending credits to tenants, share-croppers and others who do not now own farms. It cannot be stated definitely, of course, that an extension of credits alone will solve the tenant problem in the United States, but it will help do so.

Agriculture may face, as a result of this proposed type of legislation, the novel situation of the federal government actually buying farms, improvements, livestock and other operating necessities, and renting all of this property to deserving tenants for a limited term of years; or, after purchase of all this property by the federal government, a contract may be entered into between the tenant and the government so that eventually the tenant may become an owner of the property. Heretofore the federal government has not bought property to sell again or to rent. Its farm credit activities in former years have been such as would encourage farmers on their own initiative to buy land from whomsoever they desired to purchase it, and then, through the Federal Land Banks and otherwise, secure the money as loans at modest rates of interest.

It now appears that this plan may be changed, at least so far as tenants are concerned. We may have government owned farms scattered miscellaneously over the country, rented by people who now are not thought locally to be well enough equipped to handle farm lands. Naturally, this involves the federal government with a large expenditure of funds which, under one bill now pending, would amount to a half billion dollars in ten years. Of course, it is expected that this money eventually will be repaid into the federal treasury.

Interest rates on farm mortgages will be prominently before Congress this winter. Senator Wheeler of Montana, and Chairman Jones of Texas, are already in the field with measures to continue the rate at 3½ per cent for loans that originate in the national farm loan associations. These measures for two years prior, and during the present session, are in complete harmony with Farm Bureau policies. No doubt they will be enacted.

Farmers are giving more attention now to marketing agreements provided for under the Agricultural Adjustment Act and not invalidated by the Supreme Court decision. Particularly for the non-basic crops these marketing agreements open the way for better marketing and distributing of farm products. The measure needs amending, however, and no doubt will be so amended that all fruits and vegetables, also called non-basic crops, may be eligible for operations under the marketing agreement sections of AAA.

The President in his recent budget message has indicated that we are at, or near, the time when we must balance the federal budget. To do this will require not only a continuation of high federal taxes but a reduction in federal appropriations. It cannot always be expected that reduced appropriations will hit the other fellow. If we are in the beginning of a period now where appropriations are to be reduced, some reductions will need to be suffered by the agricultural work of the federal government. Where shall we begin reducing and how much reduction shall we tolerate are questions which we must face either this session or in the not distant future At least, all must recognize that the nation cannot go on indefinitely spending vast sums of money with only slight attention given to the source—taxes—from which the money comes.

The Reciprocity Act will be reconsidered and, no doubt, reenacted, since it terminates early in the present year. Several features connected with this Act are now, and will continue for some weeks, under heated discussion. In order that all may be thoroughly informed of what is going on, public hearings leading up to reciprocity agreements should be provided. Care should be exercised that parity prices for agricultural products, which is the goal of all recent farm legislation, should not be imperiled by reduction of tariff rates or the permitted importation, under quota or otherwise, of farm products from abroad.

More accent needs to be placed in the writing of these agreements on reduction of industrial tariff rates, it being the opinion of many at the present time that too many agricultural rates have been reduced. But the Farm Bureau supports the reciprocity principle and insists that the agreements be drawn between two nations rather than making them under the most favored nation clause operating among practically all nations of the world.

There will be a renewal, seemingly, of the question of consolidating the bureaus and divisions of government for the purpose of efficiency. It is safe to state that not much economy will be effected, although there is a great possibility of securing more efficient administration by proper grouping of federal activities. But one thing we must watch with extreme care. Conservation activities which relate to renewable natural resources, like game, forests, public grazing, the general land problem and reclamation, must never be allowed to be centered in the Department of Interior. We have had to fight off this proposition for two years. We may have to do it again this session. These matters of conservation should be centered in the Department of Agriculture.

Meeting adjourned at 4:20 P. M.

HOME AND COMMUNITY DEPARTMENT

Thursday Morning, January 14th

Mrs. Roy C. F. Weagley, Chairman, presiding.

After community singing, Mrs. Weagley called on Mrs. Linwood Sutton to offer the invocation.

MRS. SUTTON: Our dear Heavenly Father, we thank Thee for the privilege of meeting together again. It has been a year since our last meeting and some of us have had sorrow, while all of us have had many blessings for which we are grateful. May we gain inspiration from these meetings that will be of great help to our homes, our friends and our community during the coming year, and all this we ask in the name of the One who taught us to pray.

(All joining in the Lord's Prayer.)

MRS. WEAGLEY: We will now have the minutes of our last meeting, followed by a roll call of members. When your name is called, I wish you would come forward and get your badge.

(Minutes were read by Mrs. Randall Spoerlein, Secretary.)

MRS. WEAGLEY: If there are no corrections, the minutes will stand approved as read.

Our first speaker this morning is one who charmed me the first time I met her. That was in Boston, at the National Convention in 1930. A few years later I was privileged to hear her at the National Farm Bureau meeting in Nashville. I have found it quite pleasant to work with her, she being the director for the Southern Region, of

which Maryland is a part. It affords me great pleasure to present to you at this time Mrs. J. D. Giles, Home and Community Chairman, of Alabama.

MRS. GILES: Thank you, Madam Chairman; I want to assure you that it is quite a pleasure for me to be here. I bring to you the greetings of the Associated Women of the National Farm Bureau.

I first want to give you just a little outline of some of the fine work that our ladies are doing in the national way. I am sure Mrs. Charles W. Sewell needs no introduction to this group. I think she has made a place for herself all over the nation. She is one of those untiring women who go about over the nation helping to form the policies of rural America that all of us are working together to secure; she is one of the untiring kind that gives such inspiration to her co-workers.

We had at our meeting at the National Convention in December in Pasadena outstanding farm women, all interested in rural advancement, and those women are playing such a major role in helping to bring this about that I do want to make mention of some of our National leaders.

Our President, Mrs. Abbie C. Sargent, as you know, is a real New Englander. She is a person of very wise judgment; she gives much consideration to her efforts. She has been asked to serve on several National Committees for the betterment of agriculture. She has appeared before the Committee on Agriculture, asking for larger appropriations for our particular work, and also she has been requested to help in securing several important bills that are now in effect. She is frequently called upon to serve on National Committees, and last year served on the Social Security Board.

I am going to make mention of one or two other ladies in our group,—our Vice-President, Mrs. Ellsworth Richardson, of Iowa, and our National Secretary, Mrs. Florence Bovett, of Nevada, who is very efficient. These women have not only made names for themselves in their respective States, but also throughout the nation, for they are the only two women in the nation that are privileged to wear the distinguished service medal, which the American Farm Bureau awards to outstanding persons in the nation that have done outstanding work for agriculture. Mrs. Bovett and Mrs. Richardson are wearing these distinguished service medals along with the President, Secretary Henry Wallace, and Senator Norris, taking their place in our National life along with the men.

Sometimes I think it is wise to review the history of the progress the farm women have made in agriculture. We know that history is one of the best ways by which people can review their progress, or review their errors, and, if wise, take precaution against future mistakes. I think the change for farm women began way back in 1914, when the Secretary of Agriculture wrote to more than 100,000 farm

women and asked them what the United States Government could do to help improve the farm and to improve conditions for the farm women. The answers that these women wrote back to the Secretary showed what the needs were, and so our Home Demonstration and Extension programs were brought about to help meet these needs. For more than 22 years the resources of the United States Government have been behind the efforts to improve the farm home and to help the farm woman take her place in State and National affairs and to face the world with an intelligent and competent attitude. You know there was a time when the farm woman thought only of her home and its needs, but today she has learned through organization that the best means of information and education can be brought about only by organizing. She has learned, too, that it is through cooperation with our research and educational institutions that we can find a solution to our own problems; and she has learned that only through organization may public opinion be molded, by spreading information, so that we may have a voice in the halls of our Legislature and our Congress to get the proper allotment that Agriculture needs.

Now, these organizations of farm women did not spring up over night like the mushroom, but step by step we have such progress that I think we should be proud to say that in 1934 the American Farm Bureau realized that there was so much woman power in the nation and in their organization that there was organized State groups,—such as the State Demonstration group, the Home Economics group, and all of these were organized into large groups. And so, in 1934, the American Farm Bureau evolved a plan to organize these State groups into this National one,—the Associated Women of the American Farm Bureau, and that association today has a membership of some 350,000 farm women. Through that organization we have been affiliated with the Associated Country Women of the world, and so today we can proudly say the voice of the American farm women can be heard around the world, and why these organizations? Because they voice the aspirations and hopes of rural womanhood throughout the world.

Now, I want to briefly outline to you some of the activities that the Associated women are trying to carry out. These are things that you can work with back in your own home in the community in which you live. We have a real champion in Secretary Wallace. He says that women always insist in weaving the bright thread of beauty through the drab colors of every day life, and that men without that might become efficient and unlovely machines. So, we have tried to make a program that is national in scope, yet it is simple enough so that you can use it back in your own community. We have been trying to make a program that will embrace all the economic, cultural and spiritual phases of farm life. In these activities we have incorporated citizenship, rural recreation, reduced cost of medical care and

hospitalization. These and hundreds of other movements are in our program.

Now, our citizenship objective,—we are starting that so that every woman may become an intelligent and efficient voter. I wonder if you have ever stopped to think that statistics show that 90 per cent of the illiterate vote while we, the good citizens of the country, are just about 50 per cent. So, you see, we do have a citizenship responsibility. Some one has said that women's lack of interest in civic affairs can be attributed to two causes; first, timidity, and the second because they do not understand. We do have this civic responsibility, and we should accept that responsibility because every phase of politics affects the rural home. We are endorsing the farm legislation that is set up by the Farm Bureau.

Then, we have the objective to make the home more attractive. There are several sub-heads to this, better homes, landscaping, rural electrification. You had Mr. Cooke with you from the R. E. A., and I am sure that he gave you some interesting facts on this program of rural electrification. In October I saw a statement that in 1935 there were 118 miles of rural electrification, and to date in 1936 there had been some 1,951 miles to serve the rural people. I also understand that the State of Ohio is really doing more, as far as rural electrification is concerned, and making it a major project, more than the other States. I think the Farm Bureau has stated that it is most grateful and pleased with the results that have been attained in Ohio.

Then, we have as a major project, recreation. This year our recreation committee has asked that every State learn to sing, and if you cannot sing, why just do it anyway, try to do it. We want each State to learn its own State song, the American Farm Bureau Federation song, and one classical and also one popular song—we let you select that yourself. By learning these, I do not mean just to learn the tune, but to learn the words so that when you do come to the meetings you can just come right out and sing. We feel that when people like to play and sing together, there is a closer bond of friendship and cooperation. I hope that your Home and Community Department will give that earnest consideration and take that up with your groups and try to learn to sing together. You know Mrs. Roosevelt says you cannot let your capacity for enjoyment lie idle, you must cultivate it as you go along. So, we have recreation as one of our major projects. And sometimes I think one of the best things we can do is to learn to play and sing together.

Then, we have this public-speaking contest. That has really gone over in a big way throughout the nation. The past year we had more than one thousand women studying to speak on the subject that was assigned—"What is Ahead for Rural America." The contest has grown so that we have to handle it by regions. I am sure you have not yet heard the rules and regulations about the contest,

but they will be out in a few days. By having the contests in regions we will only have four speakers, to go into the National this year. We hope to be able to handle it in the regions, as it would be too big for the national. In August we will have our Regional Conference somewhere in the South, probably in Tennessee; we have been having it at Signal Mountain. It is up to you to find out where the Regional Conference will be held, and then you can get ready your contestants for that Conference by the latter part of August. This year we are going to have as our subject "Rural Health" and that brings us to one of our major objectives, which is reduced cost of medical care and hospitalization for farm people. You know we have three classes of people—our indigent, our middle class and our wealthy. We know the class that suffers most. Our indigent are cared for, and our wealthy are able to care for themselves, but our middle class does suffer for the lack of medical attention. California is working out a plan that has proven very satisfactory in Los Angeles County, and they are hoping to use that plan as a yard stick that other States may follow. It has proven very satisfactory both to the rural people and to the medical profession. We are cooperating with the medical profession in every way possible.

Then, we have the youth movement. We realize that there are more than five million boys and girls unable to obtain jobs, unable to engage in farming for themselves, and they are living with their parents. They have reached the age where they are not eligible for the 4-H club work, and they do not wish to affiliate with the older organization, so we are trying to work out a plan whereby the youth of America can have their own organization. In the State of Iowa they are putting over that idea in a big way, and we hope that in other States we may have greater interest in this movement. We talk of the enormous values of our national resources, our land, our water and minerals, and after all the most valuable resource of America is our youth. The future of our nation depends upon what we do with our youth.

Our object of world peace is one that every mother's heart yearns to. I think last year in June when we had the enormous Army for Peace of Rural Women in Washington, that was just a demonstration of what we can do if we only try, if we will make up our minds what we want to do. Now, we pick up the papers and we read of what they are doing in Europe, and what are we going to do about it? We don't want our sons to go out and be used as cannon fodder. We must not only think about it, but we must do something about it. I was impressed with what Mrs. Catt said at the meeting last June—we must have peace at any cost, but we do not want it to cost us our sons.

Farm women have gone a long way, they are coming into their own. I am reminded of a small boy whose father had gone on a

vacation, and he was supposed to pray for him every night. While he was doing that one night, much to the amazement of his mother, he said on his own account, "And, God, maybe you better keep an eye on mother, too." So, we are going to ask you to keep your eye on the Associated Women and help them to build a program that will meet the needs for all agricultural people throughout the entire nation. I thank you.

MRS. WEAGLEY: In behalf of all of those present I wish to thank you, Mrs. Giles, for the lovely address you have made.

Several songs were sung at this time.

MRS. WEAGLEY: We would now like to hear from Miss Kellar of the Extension Service of the University of Maryland. I will ask her to introduce the next speaker.

MISS KELLAR: Miss Weagley and friends: Before I introduce our next speaker I want to make a comment or two on the remarks that were made by Mrs. Giles. She suggested that you learn to sing, and that is following the program that we have in the Extension Service, and we are trying so hard to help people of the State learn certain things in music. There is nothing that hurts me more than to go to a farm meeting and hear the rural people get up and sing the "Old Gray Mare" and a few of those other songs that we do not feel have very much of a cultural background. While we are learning to sing, why not learn to sing something beautiful? We have published at the University a bulletin this year on songs and the stories of several songs are in that book as well as the music, and we have several of our counties learning to sing those songs at the meetings. So, those of you here representing the Farm Bureau, I hope when you return home and start your singing that you will insist on singing some of those lovely old songs that really do show our appreciation of good music.

Then, Mrs. Giles spoke about the speaking contest. I wish it were possible for every County to be interested in this contest. I went out to Chicago a year ago at the time Mrs. Spoerlein had the honor of winning the second place in the country in the speaking contest, and I think that she will bear me out that it was a real inspiration and a challenge to our women who listened and participated in that contest. I do think that is a fine thing. It not only trains for leadership, but helps in every way in the home and community work. I hope that more will participate in that than have ever participated before in Maryland.

It does give me pleasure this morning in presenting our next speaker to you. She is going to speak to you on "The Farm Family Outlook for 1937." We are always interested to hear from the experts what we are able to look forward to for the year to come. Miss Gallop has never met with us at any of our public meetings before. It is with great pleasure that I present Miss Gladys Gallup, Home

Economist of the Extension Service of the U. S. Department of Agriculture, who will now speak to us.

FARM FAMILY OUTLOOK—1937

By MISS GLADYS GALLUP
Extension Home Economist, U. S. D. A.

By Farm and Farm Family Outlook we mean, "What are the forecasts for farms and farm homes for next year, based upon economic information?"

In Washington there have been 13 annual Farm Outlook Conferences and three annual Farm Home Outlook Conferences. The purpose of these conferences is to assist farmers and farm women in planning their production and marketing programs and management programs on the farms and in the farm homes for 1937.

Farmers always have to make forecasts. No matter how inadequate the information available to them, farmers must take the future into account in planning their crop and livestock programs.

Farmers and farm women together must have some knowledge of the expected income for the year, whether it will be more or less than last year, in order to do some planning for the farm home.

These outlook reports are based upon careful analysis of available facts and represent the best judgment of the specialists of the Bureau of Agricultural Economics and the Bureau of Home Economics, as well as the State Extension and Federal Extension workers who meet with members of the Bureaus and the Annual National Outlook Conference.

The local county agents and home demonstration agents will help individuals in setting up farm and home accounts and there are outlook meetings held in your counties each year. The Farm Family Account Book is available for 15 cents from the Government Printing Office, Washington, D. C.

Farm families will have more money to distribute among items of family living in 1937, in spite of the fact that farm equipment, farm buildings, and livestock for replenishing herds will doubtless claim a large share of the expected increase in income.

Gross cash income to farmers in 1936 is estimated to be about 10 percent greater than in 1935. A further increase is anticipated in 1937.

The advance in income in 1936 varies considerably for different areas. The West North Central States, in spite of the drought, have enjoyed a 21-percent gain in the first 8 months of 1936 over the corresponding period of 1935. The South Central States, on the other hand, have felt a 2-percent decline. All other areas have had increases in income in the first 8 months of 1936 over the first 8 months of 1935, ranging from 10 to 17 percent.

Much of the effect of the 1936 drought probably will be felt in 1937 and will be mostly regional.

Besides income received from sale of crops and livestock, many farmers have supplementary sources of income from work off the farm, from tourist trade, from investments, and from the sale of handicraft articles and prepared food. During the last half of 1936 many farm families, particularly in the drought-stricken areas, have received substantial amounts from the Government—either as payment for work on roads, dams, or similar projects, or as relief payments. In some drought-stricken counties farmers are dependent largely upon W.P.A. wages or subsistence grants. Several States are carrying heavy rural-relief loads.

Although farm costs are expected to be somewhat higher next year than they have been during 1936, they probably will not advance as much as gross cash income. So, net cash available for family living will probably exceed that available in 1936. Increased cash available for family living will be offset in part by higher prices of food and of some other commodities.

During the depression farm families cut down on their expenditures for household furnishings, home repairs, medical care, clothing, and even food. It seems probable that increased cash in 1937 will go into many of these items. In areas where electric lines are being extended and the cost of electricity is being reduced, some of the increase may go for wiring, electrical service, and electrical appliances.

MRS. WEAGLEY: We are very grateful to Miss Kellar for securing Miss Gallup with her store of information which is of vital importance to farm women. We enjoyed her splendid address.

The County Chairmen will assemble in the next room and elect the officers for 1937.

It would consume too much time to give you the report on the Pasadena Convention, which I have prepared for our Home and Community Department; but I would like you to know that the women's meetings, some of which were held jointly with the California Farm Bureau annual meeting, were extremely interesting and exceptionally well attended, while the attendance at the general sessions was not always up to par. Having attended every session from Sunday evening until Friday evening, with the exception of Thursday afternoon, I had ample opportunity to size up the audiences. On Thursday afternoon, Mrs. Sewell had planned for us a trip to Hollywood to visit the M. G. M. Studio, which was a novel experience.

A chorus of 375 men and women, all of whom are members of California Farm Bureau, delighted the visitors with lovely music, during the Convention.

Mr. R. W. Blackburn, President of the California Farm Bureau, in his annual address said, "Once more, agriculture marches toward

a new horizon, and this time the nation follows. Some day the nation will acknowledge, gratefully, agriculture's contributions in routing the forces of economic depression. Some day agriculture will pay tribute to the Farm Bureau for mobilizing the thinking and action which resulted in economic victory. Some day the philosophy and spirit of organized agriculture will permeate the hearts and minds of all America."

President O'Neal paid tribute to the leading women who have fought for the farm home. He said, "I feel that the hope of the unsolved problem of human relationship lies in the hands of the women, the only ones beside God who can show the way to go."

Mrs. Sewell reported 402,177 members in the Associated Women of the American Farm Bureau.

Mrs. Giles, Director for Southern women, suggests that we learn "Farm Bureau Spirit," our State song and three other songs.

The Organization Training School, a cooperative movement, shared by farm organizations, and the extension service, was strongly advocated by Mrs. Mies of Illinois. This, I believe, is something that our Maryland Farm Bureau could use to great advantage.

The New York Home Bureau is divided into four districts and each district chairman brings three other women with her to the college to be trained in group discussion.

Another important problem in rural life is the urgent need for a Junior Farm Bureau as was pointed out by Mr. G. M. Strayer, President, Junior Farm Bureau in Iowa. He said that there are on the farms in the United States five million young men and young women, between 18 and 28 years of age who have the inherent desire to participate in activities as members of a group. Of course, they need organization and direction. This, too, is something that we should consider.

In the beautiful memorial service conducted by Mrs. Sewell, the late E. Thomas Massey, of Kent County, was one of those remembered.

I am very glad to have had the privilege of serving as delegate for the Farm Bureau Women of Maryland to the Second Annual Convention of the Associated Women of the American Farm Bureau, in Pasadena, California, December 6-8, 1936. While in Pasadena I was made delegate to the 18th annual convention of the American Farm Bureau Federation, representing the women from the Southern region. It was, indeed, a wonderful experience that will long be remembered. I thank you.

The Committe reported the following nominations:

Mrs. Roy C. F. Weagley, Chairman,
Mrs. H. T. Williams, Vice-Chairman,
Mrs. R. G. Spoerlein, Secretary.

These officers were duly elected.

It was suggested that we have one meeting together some time during the summer, as the Maryland Farm Bureau did last summer.

MRS. WEAGLEY: I would like to state that the Farm Bureau has already approved a mid-year get-together meeting, something in the nature of the summer meeting at Betterton; so the request, as previously made, has already been granted.

I appreciate the confidence you farm women have placed in me, and I hope I may not disappoint you and that with your help I may be able to do the things this year, that I wanted to do but did not accomplish last year.

Will the County Chairmen, the state officers and our guests please go to Parlor K for luncheon? We can then discuss matters more freely than in a large meeting, and also get to know each other better.

Meeting adjourned.

LUNCHEON

MRS. WEAGLEY presiding: We want to extend a vote of thanks to the Maryland Farm Bureau for granting us this luncheon. Motion made and seconded and carried, and the Secretary instructed to extend that vote of thanks.

It is a delight to have our guest speaker, Mrs. Giles, with us. We are sorry that we could not have Miss Gallop as well, but she had duties that called her elsewhere. You all know Miss Keller, we are glad to have her as a guest. Mrs. Nuttle, our President's wife, is with us, and Mrs. Stuart, former Secretary of our Home and Community Department. We invited our first chairman, Mrs. Jones, but she declined. We are sorry that she could not be here. We are glad to have our past chairman, as well as present vice-chairman, Mrs. Williams. I am going to ask each of you to rise and give your name and County from which you come. That helps us to remember each other.

(Starting from the left, the ladies rose and gave their names and Counties as follows:)

Mrs. Roy C. F. Weagley, Chairman, Washington County.
Mrs. Randall Spoerlein, Secretary, Carroll County.
Mrs. Melvin Stuart, Past Secretary.
Mrs. Harry Nuttle, wife of State President, Caroline County.
Mrs. P. D. Brown, Charles County.
Mrs. Lloyd Balderstan, Cecil County.
Mrs. John D. Young, Carroll County.
Mrs. Charles Schlee, Dorchester County.
Mrs. Harry Brasenne, Howard County.
Mrs. Arthur Weed, Pianist, Baltimore City.
Miss Cookinham, Song Leader, Wicomico County.

Mrs. W. W. Hopkins, Talbot County.
Mrs. Harry Williams, Kent County.
Miss Venia M. Keller, State Home Dem. Agent.
Mrs. Harry Davis, Frederick County.
Mrs. J. A. Fowble, Baltimore County.
Mrs. C. J. Kern, Caroline County.
Mrs. L. A. Sutton, Kent County.
Mrs. Daniel Roth, Washington County.
Miss Winifred Adkins, Wicomico County.
Mrs. J. D. Giles, Alabama.

MRS. WEAGLEY: One of the objects of this meeting, as I said to the State officers, is that some definite project may be adopted for the coming year, so that we may know definitely for what we are planning. Mr. Wise said he thought Recreation, or how the farm women can help the community, particularly by way of recreation would be a good idea. Of course, that all appeals to me, and I know it will to most of you women. In the meantime, we had this joint connection with the Southern States—Cooperative, I should say, and inasmuch as we are trying to put that across in the State of Maryland, Mr. Wise feels that discussion groups would be a great advantage, and would help promote that program over the State. Well, inasmuch as I had talked with some of the ladies about the recreation idea I did not know whether you would want to carry on both projects. I think I will put it up to the group at this time. I am going to ask you to discuss that now. I would like our former Chairman, Mrs. Williams, to open the discussion, and give us some ideas. She has been so helpful in all the Farm Bureau work, and has made such a success of her work in Kent County. We hope she will tell us, in other Counties, how to go about this work.

MRS. WILLIAMS: Madam Chairman, I don't know about my success—sometimes those things are due to a great many things. We have increased our membership down there. I am Secretary now, and most of the work goes through my hands. I always felt, as Chairman, that I was unable to get my thought over. Any program should be something the Farm Bureau can do. I never saw the need for an organized department in the Counties. When I came in office, the women's clubs were already organized and most of the work was being duplicated. We thought we would try to work cooperatively with them.

I do think the recreational feature is a good idea. The young girls do not like to attend the public dances. There are no supervised dances in those counties, none of any kind. There is a need in our county for a place where we can have our entertainments. We cannot afford to pay $20 a night to use our high schools. It is too expensive.

I think the discussion groups would be a very good idea, too, a program trying to put over this matter in our own Farm Bureau groups, the thoughts and ideas of the National Farm Bureau are not well known, and we cannot get that over as well. I think it would be fine if we could have our counties divided up into districts for these discussions. In our county we have four district meetings. We could have these discussions or join together and have it as one, bring it before the women, and you will find the women are glad to learn about the Farm Bureau. I find they do not understand it. We have the cooperative in our county, the Farm Bureau is beginning to get that across down there. Most people do not know the Farm Bureau and its functions at all, they only know there is a little buying and selling down in Chestertown. I thought the discussion group idea very fine. The need I spoke of should be filled, and it never has been.

MRS. WEAGLEY: I thank you, Mrs. Williams. That is quite fine. Now, let's hear from Mrs. Kern.

MRS. KERN: I have an idea as to the meeting place. In one of our recent P.-T. A. meetings there was a woman speaker there, a leader in education in the State, and she made the suggestion that the High School buildings are not used enough for community affairs. I was just wondering whether that would not solve your emergency problem in Kent county. We approach the School Board, go at it in the right way and you ought to be able to get those buildings for just such meetings. Quoting from a conversation I was in last night, I was asked what to do with these boys and girls, they want some form of recreation, or they are going to these roadhouses. One of my co-workers in my county said the same thing. In her particular neighborhood there was a very notorious roadhouse, and her girls are now big enough to dance—and they all want to learn to dance for some reason or other, hard to explain—but her girls will go there if there is no other place provided for them to go to. I personally think if we approach our School Board, and ask for the use of our school buildings, we can get them for the light bill. The heat is there anyway and the janitor. There may not even be any charge. It is a thing that helps the county. It is a community problem as well as a Farm Bureau problem. Personally I would like to see some recreational work started in our own county; we do not have enough of that type of recreation for young folks.

Now, as to the discussion part of it, that covers a broad field. I find that so many women do not know a thing about Farm Bureau work. They do not know what we are working for. We have plenty of room in our county for plenty of work.

MRS. GILES: May I make a suggestion? Perhaps you could solve your problem by having these open discussions for a group in the evening and bring in this young element. We do want to provide a

short discussion on some educational feature about something that you are trying to put across, and then finish up the evening with entertainment. You could plan your program in that way and hold the interest of the entire community. That is one way in some of the states they are solving this problem, by having the discussion groups and having this entertainment finishing up the evening. You will get the school building easier if you have the educational feature.

MRS. WEAGLEY: Thank you, Mrs. Giles. I think that is splendid. That gives us an idea as to how we may carry out both projects without any special effort one way or the other. I will now call on Mrs. P. D. Brown.

MRS. BROWN: The Farm Bureau down in Charles County has board meetings in four consolidated schools, holds a meeting at each during the year. As Home and Community Chairman, I am supposed, it seems, to have an idea of what they have as a program. I have had a great deal of help from our Home Demonstration Agent in suggested programs for these meetings. We have good cooperation there. By the way, Miss Gallop was talking about the cooperatives. Do the rest of you know that Farm Bureau members can get their electric supplies cheaper?

Miss Adkins of Wicomico was called on next.

MISS ADKINS: Speaking of get-together meetings, we have in our county two annual affairs; one is when the men do the entertaining—give an oyster roast down on the river shore, followed by an old square dance in the hall. Then, later on, the women entertain the men, have it in the Grange Hall in connection with the Grange members—they overlap very often. We get together and prepare the food, some bring one thing, some another, and we all enjoy it. Sometimes we have someone come and speak, have some form of education, and then our entertainment. I think the suggestion of entertainment is an excellent idea.

MRS. BROWN: We get the high school at La Plata with no charge.

MRS. HOPKINS: The first of the year we always have a Program Committee, and this Committee meets in connection with our county agents, and they prepare a program for each month, a seasonal program as to what that month means for you. We have speakers from the college, and a little entertainment—after the business meeting we have that part, we have our fun, but during the time we are having our business meeting, the 4-H boys and girls are meeting. We have that arrangement, and we all finish our business meeting together at one time, and when we are finished we all assemble at the High School. Sometimes the 4-H members put on the program, and sometimes we do, or we put it on together. We all have a good time. Maybe the girls will put on a program of something they are doing. We always have the 4-H night, the Home Demonstration night. We always have one good time each month.

We have had that program for four or five years. I am not throwing any bouquets to our county, but the State did copy some of that program for the county meetings elsewhere.

About the discussion group matter, I submitted in my annual report that I would rather have one or two subjects and have them well discussed, so we can learn what we are talking about.

MRS. WEAGLEY: That is fine. I like the idea of all groups joining together. If we have the young folks, the 4-H boys and girls, we get the whole family meeting together.

MRS. HOPKINS: When we have the 4-H group, we find they bring out the parents.

MRS. WEAGLEY: There is another thought that I like—the way Mrs. Davis of Frederick County has four or five districts——

MRS. DAVIS: Four.

MRS. WEAGLEY: I think that is a good idea. They have these district Chairmen and let them report the local problems and needs to the County Chairman and she in turn brings them to the State meeting.

MRS. DAVIS: That is for our young people. We are well organized with our 4-H Club. The Parent Teachers have their dances in the schools, and, of course, the women's clubs; the Farm Bureau people have their entertainment,—perhaps a picture or a show each year. We are very cooperative throughout our county.

MISS KELLAR: On that subject of recreation—I understand that recreation is to be included in the Rural Sociological Program. At the University of Maryland, the recreational specialist comes in the department of rural sociology. They feel the need of recreation for the rural families, but I recently served on a Recreation Committee, and that is the reason it is so fresh in my mind. We tried to analyze what is recreation,—are we thinking of it in terms of a game, or in the terms of a picture, a show, or is it going to be reading, music, or a combination of all of these things? We find so many people either think it is dancing or playing games, or doing some of these things that Mrs. Williams spoke of. It still comes under the name of recreation. I think in planning recreation, if that is going to be one of your projects, and it is certainly greatly needed in Maryland,—but in planning recreation you should analyze the recreational needs of your community. Maybe it is coming together and having community singing, maybe putting on a play or a picture, or maybe a dance. Whatever it is, I think you should analyze very carefully so you will have a directed recreational activity, whatever it may be.

Then, for your discussion groups, I think Mrs. Hopkins brought out the real point. She really felt that the subject should be studied beforehand, so everyone would be ready to make a contribution. We had last week at the University a meeting, and three speakers in the morning brought to us the things to be discussed in group conferences, and everybody attending that conference was awakened to the

matters that would come up for discussion, and everyone was ready to make a contribution. In having your discussion groups, I would suggest that you have them well organized, with a good leader, with a speaker, and a secretary, and some one to carry the meeting forward.

MRS. WEAGLEY: Mr. Wise told me of pamphlets that are available through the Department of Agriculture. I am afraid we cannot prolong this discussion because of lack of time.

I do like one or two subjects and know them thoroughly. I think we should have what I would term a study group discussion. Sometimes we hesitate to talk unless we are sure of our subject. I believe that we should have the booklets, in advance, which will be available through the Maryland Farm Bureau, from the United States Department of Agriculture.

Mrs. Williams suggested that a note of thanks be given Mrs. Weagley. The meeting was shortly afterward adjourned.

FRIDAY, JANUARY 15, 1937

Business Session

President Nuttle called the meeting to order at 10 A. M., January 15th, Lord Baltimore Hotel, Baltimore.

The following notice of meeting was read:

To County Secretaries and Affiliate and Associate Secretaries.

Nov. 17, 1936.

Notice of Annual Meeting of Members of Maryland Farm Bureau, Inc.

Dear Sir:

Notice is hereby given that the Board of Directors has designated Jan. 12-13-14-15, 1937, as the dates for the annual meeting of members of the Maryland Farm Bureau, Inc., at the Lord Baltimore Hotel, Baltimore, Md.

Blanks are enclosed for you to submit the credentials of your directors and delegates for this meeting.

Very truly yours,

CEW:MD — C. E. WISE, JR., *Secretary-Treasurer,*

Enc. — MARYLAND FARM BUREAU, INC.

President Nuttle called on Mr. P. C. Turner, Chairman of the Credentials Committee, to call the roll. The following responded:

Anne Arundel County—C. A. Duvall; *Baltimore*—P. C. Turner, T. C. Sherrill, T. A. Mann, Robert McCann, Charles T. Cockey, Jr., G. L. Stryker, Samuel Elserode, L. E. Ensor, P. O. Bortner; *Caroline*—Linwood O. Jarrell, F. M. Stevenson, E. H. E. Thieroff, Wingate

Neal, H. D. Shultz, Richard Blackburn, Clarence Kern; *Carroll*—John S. Bushey, George B. John, R. G. Spoerlein, Harry I. Rinehart; *Cecil*—R. H. Baker, J. S. Reisler; *Charles*—S. C. Linton, F. B. Bolten, Bergen Brown, Geo. A. Carpenter; *Dorchester*—A. K. Austin, S. W. Linthicum, A. R. Peterson; *Frederick*—Wilbert L. Smith, J. W. Mentzer, Vincent Rogers, R. E. Kling, R. C. W. Schaeffer, Robt. R. Roderick, Glen Trout, Allen M. Pitzer, J. D. Gaither, J. R. Flook, Morris A. Zentz; *Harford*—Fred Jones, W. S. Spencer, Herbert Hoopes, S. Henderson, Gladden Davis, Frank O. Foard, T. Roy Brookes; *Howard*—Roby H. Mullinix, J. W. Lord; *Kent*—H. S. Leaverton, H. S. Ford, L. A. Sutton, Norman Ford, Ed. Greenwood, O. E. Yerky; *Montgomery*—J. W. Jones, Wilson Poole, Geo. O. Holland, Ulysses Griffith, 4th; *Prince Georges*—W. R. C. Connick, Wm. E. Duvall, Charles T. Nicholson, T. P. Duvall; *Queen Anne's*—John W. Smith, C. W. Butler, Chas. I. Boyle; *Somerset*—M. F. Carver, Wm. T. Chaffey; *Talbot*—Francis Shillinger, R. C. Mueller, T. C. Schwaninger, Mr. Boley, E. E. Thomas; *Washington*—R. C. F. Weagley, Daniel Roth, J. D. Coffman, Earl Long; *Wicomico*—C. C. Phillips, Carl Smith, Geo. Wright, J. D. Brown, J. W. Adyelotte; *Worcester*—Ralph E. Shockley, Willard Evans; *Maryland State Poultry Council*—Mrs. Kern, Mrs. Carter, Mrs. W. W. Hopkins; *Tobacco Growers*—S. C. Linton, Oden Sansbury; *Vegetable Growers Association*—Joshua Lynch; *Hillsboro-Queen Anne Cooperative Corporation*—T. B. Todd, Jr., Charles I. Boyle; *Maryland Cooperative Milk Producers, Inc.*—Robt. Gist, T. Roy Brookes, Daniel S. Pearce; *Agricultural Corporation*—A. G. Ensor, E. C. Speaks; *Maryland F. B. Livestock Mkt. Association*—Charles T. Cockey, Jr.

MR. NUTTLE: I would like someone to make a motion that this roll call constitute the official body, with such alterations as may be made later.

Mr. Pearce of Baltimore County made the motion; Mr. Connick of Prince George's County seconded the motion, and it was duly passed.

Mr. Nuttle called for the reading of the minutes of the organization at the meeting at Betterton last summer, and Secretary Wise read the minutes also filed with the association.

MR. NUTTLE: You understand that for years we have been going along without a real corporate set-up. It was not business-like. Now, we are incorporated as the Maryland Farm Bureau, Inc., a corporation of the State of Maryland. Now, will someone please move that these minutes be accepted?

This motion was duly made and seconded and carried.

Motion was made by Mr. Mueller, seconded by Mr. Linton, that the actions of the Board of Directors as contained in the minutes of their proceedings, since the last annual meeting, be hereby approved and their actions ratified. Motion carried.

MR. NUTTLE: The report of the Secretary and Treasurer was given

at the general meeting on Wednesday afternoon, but I think we should have a short report here this morning. That report shows that we are in the black this year with some $300.00.

MR. JOHN: I understand you to say that we were in the black some $300.00. Does that mean absolutely in the black, or does it just mean this past year, and there may be some back indebtedness?

MR. NUTTLE: No, we have assets of I should say some $17,500. We have increased the net assets this past year $300, and paid all bills. Is that what you want to know?

MR. JOHN: That is what I want to know.

MR. NUTTLE: I really think that statement of our assets should be read, so our people will know about it; it is your business. The Auditing Committee went over all this and found it correct and reported it, but I think it would be fine to have the statement of the assets read to you now.

Mr. Wise then read the accountant's report, which had been duly accepted on Wednesday at the general meeting.

MR. NUTTLE: Now, is there any other information that you want about this?

MR. THIEROFF: What do those assets consist of?

Mr. Wise read itemized list of assets.

MR. NUTTLE: Are there any other questions as to our financial position? I think most of us would like to have our assets in as liquid position as the Maryland Farm Bureau's assets are,—I mean our personal assets.

MR. WISE: I have 25 copies of this report mimeographed; if any one is particularly interested and wants that, it is available, and you can have it by calling for it.

MR. ENSOR: I move that copies of that be sent to each county director.

Motion seconded by Mr. Thieroff.

MR. NUTTLE: You will get it anyway with your annual report.

Mr. Bushey made the motion that the Treasurer's report be accepted and approved. Motion was seconded by Mr. Claude Phillips, of Wicomico County, and duly passed.

MR. NUTTLE: Next will be the report of the Committees. We are separating them in two parts,—the report of the Tax Committee will now be presented by Mr. Etzler, a member of the Frederick County Board. I am wondering if you want this whole report read, or will you let Mr. Etzler select certain parts to read to you. You all will have copies of it. Every member has received a copy.

MR. ETZLER: Fellow Farm Bureau members and ladies, I do not know why they picked on me in this committee to read this. I think they must have done it because I am the only dirt-y farmer. There are some gentlemen farmers, and some business men on that Committee, but I am the only dirt-y farmer on it, and so I am picked

out to render this report. I just want to read the top part, the introduction. I do not know who wrote this introduction. If the Secretary did, we should hand him a few flowers.

(Reading introduction.)

Now, gentlemen, there are some thoughts for you to consider when you get home. I am only going to read parts of this to you, not the tables. To read it all would only be taking up your time. But if I go too fast, just stop me and ask questions. If I can't answer them the others on the Committee can.

(Reading sections of the report.)

Now, I just want to say one more word. I hope that you people will read that introduction there above the names of this Committee, and study it. I am sure this work that has to be done at Annapolis will need your support. I am sure that is going to be a very hard job to put over. I thank you.

MR. NUTTLE: That was a very fine presentation. I think we should thank Mr. Etzler for this presentation, and also thank the Committee. As a matter of fact a great deal of work was done by Mr. Paul Walker, tax expert, getting up these tables. I think we ought to give him credit. Mr. Walker and Dr. DeVault did a great deal of work. Now, how will you handle this report? Accept it as a whole, or the different recommendations, one by one?

HERE IS YOUR STATE TAX COMMITTEE REPORT

For a number of years the work of the Joint Tax Committee of the Maryland State Grange and Maryland Farm Bureau has been one of the outstanding services of farm organizations of the State. Not only has it been of service to farmers, but it has had a stabilizing influence for the better on tax practices in Maryland.

Before the 1936 special session, your tax committee was the first in the field with definite recommendations as to how revenue could be raised without placing further burden of taxation on those already overtaxed. That program, with slight amendment, was adopted at Annapolis.

Again this year, your representatives have given exhaustive and early study to the tax question as it confronts lawmakers who will gather in January. It will require the combined support of Farm Bureau members in all parts of the State to secure this program, which is believed fair to all, and will bring a fairer deal to farmers in the entire question of allocation of the tax load.

Study these recommendations carefully, consider them in your Farm Bureau meetings, and, combined with the thought of your County Tax or Legislative committee, present them to your representatives at Annapolis.

This report was drawn up by a committee consisting of D. G. Harry, chairman; C. E. Wise, Jr., secretary; H. H. Nuttle, R. C. F. Weagley, T. B. Symons, E. M. Etzler, T. Roy Brookes, A. G. Ensor, Homer Remsberg, W. P. Walker, S. H. DeVault and C. T. Cockey, Jr.

Efficiency and economy in government are the first considerations of a sound tax program. To simply broaden the tax base by adopting new tax measures, without reducing the existing taxes, will bring little relief. State and local governments should live within their incomes in respect to current obligations, and future issues of bonds should represent urgent necessity for public improvements. Whenever possible to do so, bonds should be recalled and reissued at lower interest rates; but the refunding of bonds coming due is a practice to be deplored.

Irrespective of our wants and needs, we should not accumulate excessive debts for the future generations to pay. In view of the recovery in business and the general improvement in economic conditions, it seems desirable to retire our debt as rapidly as possible and to maintain a balanced budget. The retirement of debts in prosperous times will keep governments from being embarrassed during depressions.

Economy in government may be effected in many ways. The following points should be stressed in a program of economy:

1. Such reorganization of county governments as will produce the most efficient use of labor and do away with overlapping offices and functions;

2. Careful scrutiny of additional expenditures, such as for public aid, which impose an increased cost upon the State and counties;

3. Replacement of fee system compensation by salary compensation.

A reduction of about 35 per cent was secured in the real estate tax bill of farmers and others in 1934 over previous years. This reduction was brought about partly through State aid whereby State revenues were allocated to counties for schools and roads, and partly through economies within the counties.

The trend in county tax levies since 1934 has been upward. For instance, in 1934-35, the total levies of the counties amounted to $10,163,000; for 1935-36, that total was $11,571,000; and for 1936-37, the total levies amount to $12,631,000. Therefore, in two years the county levies have increased nearly $2,500,000. Part of this increase has been due to the increase in the tax basis; the major portion has been due to an increase in the tax rates. A restoration of salaries, levies for public assistance and election expenses have been the major reasons for increases in the levy. In some counties, a too drastic reduction in taxes took place in 1934 and 1935. Much of the increase

has been in the suburban areas incident to growth and development of such communities. It is encouraging to note that many of the counties have increased their levies very slightly during the past two years.

TABLE 1. Total Taxes Levied from All Sources for County Purposes in Maryland, 1934-35, 1935-36 and 1936-37.

COUNTY	TAX LEVIES 1934-35	1935-36	1936-37
Allegany	$ 985,500	$ 1,264,030	$ 1,275,987
Anne Arundel†	850,306	925,113	954,280
Baltimore†	2,339,310	2,317,400	2,679,205
Calvert	63,719	80,493	103,494
Caroline	152,530	199,028	156,012
Carroll	392,967	444,195	433,022
Cecil	310,676	323,448	329,736
Charles	89,028	111,951	110,279
Dorchester	218,198	252,341	270,598
Frederick†	627,575	673,744	679,374
Garrett	179,471	179,711	180,159
Harford†	482,241	473,295	561,585‡
Howard	202,822	240,572	263,427
Kent	140,382	242,347	199,361
Montgomery	874,418	1,368,533	1,561,381
Prince George's	617,855	645,670	839,036
Queen Anne's	125,640	166,539	174,686
Saint Mary's	79,939	86,102	86,730
Somerset	124,116	146,348	150,116
Talbot	178,164	186,736	218,898
Washington	652,948	720,815	795,441
Wicomico	282,272	330,975	413,023
Worcester	193,575	191,973	195,731
Total	$10,163,649	$11,571,359	$12,631,561

†Counties now using calendar year as levy year.
‡Calendar year 1937.
Source of Data: County levy statements.

For 1936-37, 12 counties increased their tax rates over the rates of the year before; four counties decreased their rates; and in seven counties the rate remains the same. Inasmuch as little change has taken place in the assessments on farm property for eight years, the tax rate becomes the important item and the interest of farm organ-

izations should lie in the direction of keeping these tax rates at a low level.

Legislation At Special Session

The special session of the 1936 Maryland Legislature enacted the following taxing measures to provide funds for public assistance, including old age pensions, aid to the blind, aid to dependent children and general relief.

1. The motor vehicle titling tax of 1 per cent of the sales value of motor vehicles, passed in the regular session of 1935, was continued.

2. A tax on beer of 75 cents per barrel (or 2 7-16 cents per gallon) was levied on beer sold by manufacturers or wholesalers to retailers in this State.

TABLE 2. County Tax Rates for Maryland, 1934-35, 1935-36 and 1936-37.

COUNTY	COUNTY RATES		
	1934-35	1935-36	1936-37
Allegany	$1.25	$1.42	$1.50
Anne Arundel†	1.81	1.89	1.90
Baltimore†	1.18	1.26	1.49‡
Calvert	1.10	1.35	1.70
Caroline	.98	1.08	1.07
Carroll	1.00	1.10	1.10
Cecil	.80	.78	.78
Charles	.90	1.15	1.10
Dorchester	1.00	1.00	1.22
Frederick†	.90	.95	1.00
Garrett	1.00	1.00	1.00
Harford†	.95	.95	1.08‡
Howard	.95	1.00	1.15
Kent	.84	1.21	1.20
Montgomery	.90	1.50	1.50
Prince George's	.99	1.00	1.28
Queen Anne's	.78	1.00	.90
Saint Mary's	.92	1.00	1.00
Somerset	1.00	1.20	1.20
Talbot	.85	.85	.90
Washington	.88	.97	1.06
Wicomico	.88	1.06	1.31
Worcester	.95	.95	.95

†Counties now using calendar year as levy year.
‡Calendar year 1937.
Source of Data: County levy statements.

3. A tax of 5 cents per gallon was levied on each gallon of whiskey or other spirits distilled for beverage purposes in this State.

4. A tax of 1 per cent of the gross receipts from admissions to all places of amusement in the State was enacted. In addition, a tax of from 5 to 15 cents is levied upon free admissions or reduced rates of admission to places of amusement.

5. A tax of 10 per cent of the retail price was levied upon toilet articles and cosmetics sold at retail in Maryland.

6. The existing franchise tax rate on domestic corporations was increased 100 per cent, and the existing franchise tax on foreign corporations was increased 200 per cent.

Estimated returns of the above revenue measures are placed at $3,500,000. This sum is dedicated to public aid. The expenses of administering the above taxes and to provide for refunds are to be deducted first. Then, the necessary administrative expenses of the Board of State Aid and Charities is provided for. A sum not to exceed $1,000,000 is next set aside for the State's share of old age pension payments. Aid to dependent children payments cannot exceed $1,450,000. Some provision is made for State aid to the blind but the remaining balance, not in excess of the above necessary payments, is distributed, 60 per cent to Baltimore City and 40 per cent to the counties for general relief. Table 3 shows State tax collections from the special relief taxes for the first five months of collections. On the basis of the total revenue during that period of $1,765,820, the probable revenue for one year's time will be approximately $3,500,000. We consider these revenues sufficient for the State's share of real relief needs in Maryland.

We recommend that the special taxes enacted at the Special Session of the Legislature be the basic sources for the State revenue for relief purposes. We definitely oppose a gross receipts or sales tax of any kind, other than the present excise taxes on special commodities.

Highway Finance

Highway revenue constitutes about 44 per cent of the tax income of the Maryland State government. Total State highway revenue accruing to the State Roads Commission, and subsequently to Baltimore City and the counties, approximates $12,000,000. Gasoline taxes and motor vehicle revenue are collected for the purpose of building and maintaining a road system in this State. While these revenues produce large sums, the road system is not adequately provided for. This is particularly true in respect to the main highways and the local unimproved roads.

In the past a disproportionate amount of the road money has gone to build unnecessary high-cost secondary State roads. This has pre-

vented the proper balancing of the highway system on the basis of needs and usage. We, therefore, favor the present survey that is being made of Maryland's road problem and we hope that the findings of this survey will be utilized for the purpose of using road funds more effectively.

It is our belief that all highway cost should be paid for out of gasoline tax and motor vehicle revenues, and that no diversion whatsoever of gasoline taxes or motor vehicle revenues should be permitted for uses other than roads and streets. To divert funds needed for highways and contributed by highway users in order to prevent additional tax levies for other State purposes is unfair to highway users and results in neglected roads and an ultimately increased cost of caring for such neglect. It should not be necessary to levy a State or county property tax for road purposes. We, therefore, recommend that, in the preparation of the next budget, no highway revenues mentioned above be diverted to the general fund of the State Treasury, either directly or indirectly. We favor the reenactment of the act allocating 70 per cent of the one and one-half cent lateral gas tax back to the counties for road construction, maintenance and debt service.

Assessments

A general reassessment every five years is required by law in Maryland. The Legislature of 1933 postponed a general reassessment until 1935 and it was again postponed until 1937. Unless legislation is passed to postpone the reassessment again, the State Tax Commission will be required to order a general reassessment in 1937.

Many conditions and factors have produced inequalities in assessments since 1927. These inequalities exist among individual properties, among election districts, and among counties. We believe that a general reassessment of property in the counties is justified and recommend that such a reassessment be made in 1937.

Reduce State Real Estate Taxes

The purpose of all taxation measures is to finance the necessary governmental functions of the taxing unit. A properly balanced tax system spreads the tax burden so that each individual bears his proportionate share of the cost of these services. Maryland's tax system is not balanced in that real estate pays an unjust portion of the taxes, both county and State. Real estate taxes are levied arbitrarily on the assessed valuation and with no direct bearing on the return on this value. In some measure our real estate tax is a capital levy. This was clearly demonstrated during the depression by the numerous tax sales. We bitterly oppose any backward steps to increase property taxes which are both regressive, unscientific and often confiscatory.

Our State tax system needs to be better balanced and this serious inequality corrected. An income tax will do this and, as a complement to the real estate tax, provide a much sounder tax system. Other States have recognized this principle and 28 tax personal net incomes while five other States tax certain kinds of incomes.

In recommending this tax, we as farmers do not do so with expectation of securing an advantage over other classes. We support the type of income tax that treats all groups of society equally in respect to their relative abilities to contribute to the governmental expenses. Farmers feel that they would willingly pay an income tax when they have the income. Many individuals in other lines of business take the same stand.

The income tax can be recommended because:

It reaches persons with incomes from sources other than real estate; it taxes all persons largely on their relative abilities to pay; it taxes the entire income over the exemptions, and is not simply a tax on the necessity to consume, as the sales tax is; it reaches a class of self-supporting individuals not otherwise taxed.

An income tax will broaden the State tax base and place a direct tax on those who have the ability to pay. It will be the start of a better permanent fiscal program for the State of Maryland.

TABLE 3. State Tax Collections from Special Taxes Levied by the 1936 Special Session of the Maryland Legislature for Relief to the Needy†

	April	May	June	July	August	September	Total
Motor vehicle titling tax	$56,821.11	$ 53,717.61	$ 56,348.90	$ 58,999.36	$ 46,153.80	$ 34,578.87	$ 306,619.65
Beer tax	.....	52,732.99	102,033.95	95,647.28	92,617.15	69,986.37	413,017.74
Whiskey manufacturing tax	.....	84,815.99	87,074.93	87,940.50	79,335.19	61,373.25	400,539.86
Admissions tax	.....	22,800.40	19,870.18	16,197.74	16,121.32	18,106.42	93,096.06
Franchise tax—domestic	.....	17,514.00	91,762.00	45,265.00	34,178.00	35,627.64	224,346.64
Franchise tax—foreign	.....	525.00	67,607.77	131,366.88	15,478.50	.....	214,978.24
Cosmetics tax	.....	22,330.35	24,148.13	24,161.17	22,639.18	19,943.77	113,222.60
Total	$56,821,11	254,436.34	$448,845.86	$459,577.93	$306,523.23	$239,616.32	$1,765,820.79

†The following revenue will probably be derived in one year's time on the basis of receipts to October 1, 1936, and taking into consideration apparent differences in the seasonal variations:

Titling tax	$ 600,000
Beer tax	800,000
Whiskey tax	1,000,000
Admissions tax	225,000
Franchise tax	600,000
Cosmetics tax	275,000
	$ 3,500,000

We recommend to the Maryland Legislature that it pass a tax measure that will tax net incomes, with the following features:

1. A rate of 2 per cent on all incomes.
2. Provide for exemptions the same as the Federal income tax law.
3. Dedicate the revenue for either or both of the following purposes:

   a. To service the present bond issues now serviced by the State real estate levy of 22 cents and provide that said real estate levy be reduced proportionately by a proclamation.

   b. To increase the school equalization fund and thereby decrease the county minimum school program levy from 47 cents to 30 cents.

Table 4 shows Federal income tax collections in Maryland from individuals and corporations for the last five years. In last year's report of this Committee, estimated revenues from an income tax of two per cent on individuals in Maryland ranged from $1,402,000 to $2,051,000. Inasmuch as incomes have increased approximately 30 per cent since that time, the probable revenue from such a tax would now be from $1,825,000 to $2,665,000. This revenue would be materially increased by lowering the exemptions but using Federal returns as a basis for State computations.

The present State debt will require a 25.5 cent State tax rate in 1937; 23.3 cents for 1938; and will decline thereafter until the present debt is finally retired in 1951. This computation does not include the $8,500,000 emergency bond issue of 1935, serviced by the increased inheritance tax measure with a provision that property taxes be levied in case the inheritance tax is insufficient to service the bond issue. Table 5 shows the State tax return equivalents for debt purposes in future years.

One effective means of reducing the property tax is through the elimination or reduction of the State tax rate. Inasmuch as the present State debt makes a reduction of the tax rate impossible except by the transfer of funds to the bond fund and the release of the property tax by proclamation, it is urged that future debt obligations incurred by the State be supported by other sources of revenue. This will in time make it possible to lower the State general property tax rate. If an immediate reduction of the State rate is advisable, we recommend that additional revenue such as furnished by an income tax be applied for purposes of such reduction.

Summary

This committee offers the following recommendations, embodied or implied in this report, for your consideration:

1. *Strict economy in government and minimum issuing of bonds.*

2. *Re-enactment of the present special relief taxes as basic State revenue sources for relief purposes.*

3. *Dedication of highway revenue to road purposes, without any form of diversion.*

4. *Re-enactment of the act allocating 70 per cent of the one and one-half cent gasoline tax revenue back to the counties.*

5. *Reassessment of property in the counties in 1937.*

6. *Enactment of a State net income tax on individuals, as a means of reducing the State or county taxes on real estate.*

TABLE 4. Federal Income Tax Collections in Maryland for the Years Ending June 30, 1932 to 1936.

Year Ending June 30	Tax on Individuals	Tax on Corporations	Total Tax
1932	$10,025,373	$11,796,430	$21,822,803
1933	9,148,879	9,800,581	18,949,460
1934	9,859,279	9,294,744	19,154,023
1935	11,816,154	10,239,210	22,055,364
1936	15,045,198	10,830,140	25,875,338

TABLE 5. Approximate State General Property Tax Rate Required by Law to Pay State Bonded Debt, 1937 to 1951.

Year	State Tax Rate Required† (cents)
1937	25.5
1938	23.3
1939	21.5
1940	21.5
1941	20.8
1942	16.8
1943	16.6
1944	13.6
1945	13.5
1946	9.7
1947	9.7
1948	6.8
1949	6.8
1950	1.8
1951	0.9

†Does not include the bond issue of 1935 for $8,500,000, for which a property tax may be levied in case the inheritance tax dedicated to servicing that bond falls short of being sufficient to provide for same.

MR. WEAGLEY: I move we accept it as a whole. I want to call your attention to the article in *The Sun* this morning that the Governor is going to advocate a diversion of more money to the State treasury from the roads, and we are going to have to come out right strong on that point.

Mr. Connick seconded the motion.

MR. P. C. TURNER: I represent the Highway Users Conference, an organization gotten up before the last general session of the Legislature to fight the diversion of this money from the roads. A number of organizations combined to form this organization. We got busy and worked hard down there at the special session, and they really did not divert so much, but we were not only interested in the prevention of more diversions but in recapturing some of the money that had been diverted. We want to go further. We want to consider a Constitutional Amendment prohibiting forevermore the diversion of gasoline tax from the use on the roads. I understand the Roads Commission is in favor of such Constitutional amendment. I was told that this would be offered at this annual meeting. I do not know whether we want to endorse that Constitutional Amendment, but I do think we want to recommend this to our joint organizations. We want to draw attention to the fact that out of twelve million dollars of taxes only one million is left for road construction after paying maintenance and debt service on roads bonds. Now, it is a question whether we want to recapture that money going into the general fund now. I would like an expression from this organization as to how far we want to go. I don't know. As Chairman of the Highway Users Conference, we are demanding that, but I would like this organization to go on record and tell me where I stand in the future. I do want to offer as an amendment a very strong condemnation of what it says in the morning paper. They want to use not only the money diverted, but to take a lot more. Maryland used to rank third in the country in good roads, and now we have drifted down near the bottom, and out of twelve million dollars coming into the State Treasury from this gasoline tax and so on, only one million is left to go into roads construction. I would like to hear from you on that.

MR. NUTTLE: I am wondering whether there is a clause in our Resolutions Committee report with reference to that. Our Tax report is already printed and completed, and we do have a resolution on that. I am wondering if you could not prepare an amendment to that, and let the tax report go through as written.

MR. TURNER: All right.

MR. NUTTLE: Then, if you have no objection you could get your thoughts arranged and present something that could come up when we consider the resolutions and let us adopt this tax report, which has already been adopted by the Grange.

All those in favor of adopting this tax report as presented please rise. It was so ordered.

I now present Mr. Wilbert L. Smith, Chairman of Resolutions Committee.

Now, do you want this whole report read first, or do you want to vote on each one as read?

Mr. Connick moved that a vote be taken on each paragraph. Motion was seconded and carried.

MR. SMITH: Mr. Nuttle, members of the Farm Bureau and voting delegates: The Resolutions Committee begs to offer the following report.

1. We pledge anew our confidence in President O'Neal and the other officers of the American Farm Bureau Federation. We commend their efforts to correlate all organized farmers into a national program for agriculture. We are pleased with the achievements of our national Farm Bureau during the past year and pledge our support to that organization and to the Secretary of Agriculture in developing a permanent program for Agriculture through the soil conservation and domestic allotment act with any amendments that seem to be necessary in order to maintain parity prices for agriculture and at the same time conserve our soil resources.

I move the adoption.

Mr. Bolton, of Charles County, seconded the motion and it was duly carried.

Farm Credit

2. We wish to pay tribute to the value of the Federal financing and refinancing of the farmer. Many foreclosures and bankruptcies have been headed off; many families have been kept together on the farm and given a chance to work out their economic salvation. We recommend that every possible means be employed to lower the general averages of interest rates charged farmers. We believe that the cost of distributing credit can be lowered—thereby reducing the spread between wholesale rates now available and the total cost to those securing the loans.

We urge farmer stockholders to take a more active interest in the selection of directors of their respective farm credit organizations.

We support the American Farm Bureau Federation in its effort to continue the 3½% interest rate on Federal Farm Loans.

We reaffirm our endorsement of the Farm Credit Administration and urge a continuation of lowest possible rates of interest for production and other loans consistent with the predominant rates of interest to industry.

We urge the continued liberalization of rules and regulations governing such loans to enable deserving farmers to secure reasonable credit for the conduct of their business.

I move the adoption.

Mr. Shillinger, of Talbot County, seconded the motion and it was so ordered.

Public Safety

3. We pledge our cooperation to all agencies working toward the prevention of automobile accidents and the elimination of road hazards, wherever possible. We urge the strict enforcement of laws and traffic regulations having a bearing on our accident record, and since many of our serious accidents are caused by those driving while under the influence of intoxicating liquors, we urge that a jail sentence be imposed on those convicted of this offense.

We also recommend such increase in the number of State Police as will provide adequate patrolling of our highways.

We urge the Governor, Legislature and State Roads Commission to prosecute a vigorous policy in the elimination of grade crossings.

I move the adoption.

Mr. Connick, of Prince Georges, seconded the motion and it was so ordered.

Farm Tenancy

4. We are heartily sympathetic with a conservative national program for reducing tenancy and the encouragement of farm and home ownership. We are opposed to indiscriminate loans of public monies for the purchase of lands for any and all tenants or persons without proven experience to engage in farming. We believe that a safe program can be developed whereby every safeguard can be erected to encourage deserving tenants to purchase farm homes at the lowest possible rates of interest and amortization. We believe that such a program should be delegated to the United States Department of Agriculture and the Farm Credit Administration.

I move the adoption.

Mr. Vincent Rogers, of Frederick County, seconded the motion and it was so ordered.

Taxation—Tax Committee Report

5. We highly commend the members of the Joint Committee of the Grange and the Farm Bureau for the work done on their comprehensive report of the tax situation and their sound recommendations for tax legislation. We hereby endorse the report carrying with it the recommendations for a State Income Tax and the Excise taxes passed by the Special Session of the Legislature last spring.

I move the adoption.

Mr. Linton, of Charles County, seconded the motion and it was carried.

Conservation Program

6. The Farm Bureau as an organization, is deeply interested in conserving the natural resources of our State. We believe that a careful study should be made of present legislation and a proposed program be drawn for the more effective conservation of our game resources, as well as the great resources of the Chesapeake Bay. We pledge our cooperation with other state agencies interested in this cause.

I move the adoption.

Mr. Allen M. Pitzer, of Frederick County, seconded the motion, and it was so ordered.

Land Use

7. The Maryland Farm Bureau is sympathetic to the development of an intelligent and systematic land use policy. We recognize that there are several sections in the State which contain sub-marginal land that could be better devoted to reforestation and conservation than to any phase of agricultural production. Our organization wishes to cooperate with the State and Federal Governments in their present and future plans for proper land use.

I move the adoption.

Mr. George B. John, of Carroll County, seconded the motion and it was so ordered.

Cantaloupe Control

8. We urge that the Governor of Maryland include in his budget to the Legislature the appropriation of additional money for the enforcement of the Cantaloupe Inspection Law.

I move the adoption.

Mr. Thieroff seconded the motion.

MR. CHAFFEY: Does that include our strawberries?

MR. NUTTLE: That all comes under the University of Maryland.

MR. CHAFFEY: I only thought the strawberries should be included in that.

MR. NUTTLE: Do you wish to amend that by adding or including strawberries?

MR. THIEROFF: All we do is to talk about these things. I think it would be a good idea to have a Committee to investigate this entire inspection field and get it correlated so as to strengthen our position and really do something about it. It is quite a study. I think we should get plenty of help from the Inspection Department of the University of Maryland.

MR. NUTTLE: That is right.

MR. THIEROFF: That is what should be done, and then in our next meeting, or two years from now, when the next Legislature meets, that could be drawn up into a law, and get plenty of backing to bring

it about. We had two inspectors down in Caroline County this past year, and we might just as well not have had any. They did not do near as much as they should have.

MR. NUTTLE: I think, in order to expedite matters, I will ask Mr. Thieroff and Mr. Chaffey to get together and prepare a resolution that such committee be appointed, and let us adopt that section as written. It probably can be worked out through the Inspection Department of the University of Maryland to correlate this work.

Resolution as read was adopted.

University Appropriations

9. We urge the return of the excessive cuts made by the Legislature of 1933 and 1935 to our State University, the University of Maryland. More and more, our people are needing the assistance of this institution through its research, instruction and extension work. This need is greater today than ever before. We particularly urge the return of funds previously appropriated for the promotion of our several agricultural industries, so that our extension and other forces of the institution may be enabled to serve our industry more adequately.

We desire to register our appreciation of the service rendered by the institution, and particularly the valuable aid rendered by the Extension forces in the various counties in prosecuting the adjustment program.

I move the adoption.

Mrs. W. W. Hopkins, of Talbot County, seconded the motion, and it was so ordered.

Japanese Beetle

10. We urge the appropriation of $25,000, the original sum allotted to our fight to control the spread of the Japanese Beetle in this state. We are satisfied that great sums of money have been saved to the people in the vigorous manner in which we have held back the spread of this pest in the state, and we urge that the fight be continued.

I move the adoption.

Mr. Baker, of Cecil County, seconded the motion and it was so ordered.

Weed Control

11. We recommend that the Board of Directors appoint a Committee to call upon the State Roads Commission in regards to the matter of weed control along state highways.

I move the adoption.

Mr. Thieroff, of Caroline County, seconded the motion, and it was carried.

Tobacco Re-Sale

12. We recommend to the General Assembly of Maryland the enactment of a law requiring—whenever tobacco be resold on the Baltimore market—that the seller shall remove the name of the original owner or owners from the hogshead and shall have the same inspected and resold under his own name, and that in all such cases the selling agency be required to supply the original owner or owners with a copy of the second bill of sale.

I move the adoption.

Mr. Connick, of Prince Georges, seconded the motion and it was carried.

Cooperative Business

13. We reaffirm our faith in the principles of cooperative marketing and purchasing, and pledge our active support and assistance to the Eastern Livestock Cooperative Association, the Maryland Farm Bureau Wool Pool, the Maryland Tobacco Growers Association, the Farm Bureau Cooperative Insurance organizations and the Maryland Agricultural Corporation as the Maryland representative of the Southern States Cooperative in this State. We urge the officials of all of these organizations to work closely with us, and pledge them the active participation of our organization in forwarding their activities.

I move the adoption.

Mr. Charles Cockey, of Baltimore County, seconded the motion and it was carried.

Poultry Thieves

14. We endorse the efforts of the state police, in cooperation with our poultry and general farm organizations, to prevent as far as possible losses to our producers from poultry thieves. We urge the passage of legislation proposed by the joint committee of police and producer organizations to better enable our police forces to apprehend the culprits.

I move the adoption.

Mrs. W. W. Hopkins, of Talbot County, seconded the motion.

MR. ROGERS: If they did not have a sale for that poultry, they would not bother about stealing it. A lot of poultry is stolen out my way, and they will go down and sell a chicken for 15 or 20 cents. That is the place we want to stop it. If there were no sale, there would not be so much thieving.

MR. NUTTLE: There is a Committee working with the State Police, trying to check up on that.

MRS. HOPKINS: That can be done in each county.

The resolution was then adopted as read.

Relief

15. We recommend that the administration of relief be returned to local authorities and that Federal, State and local funds be used for this purpose so that only the absolute necessities in relief be provided.

We reiterate our position that relief jobs should not be sufficiently attractive to divert help badly needed on Maryland farms.

We feel that partial payment of local taxes for relief will be the greatest safeguard against unwise and unnecessary expenditure of funds for this purpose.

I move the adoption.

Mr. A. M. Pitzer, of Frederick County, seconded the motion and it was carried.

Grades and Standards

16. We urge the passage of a general law by the Legislature giving the State Board of Agriculture proper authority to issue rules and regulations providing grades and standards of various agricultural commodities to aid in improving the quality of products offered for sale. We feel that voluntary action of this character will greatly aid in sustaining the market for some of our important vegetable, fruit and farm products.

I move the adoption.

Mr. Rinehart, of Carroll County, seconded the motion.

MR. THIEROFF: I think if part of this resolution could be changed, it would cover it all.

MR. NUTTLE: Would you like to offer an amendment?

MR. THIEROFF: The only change I can see,—the voluntary action should be made stronger so it could be enforced. That is all that is required. That is the only reason why you would not be able to do much. If a law can be passed to make it stronger. There are no appropriations made for those inspection laws, and naturally they are not very valuable. As far as this goes, voluntary action applies to honest producers, and the others do what they want.

MR. NUTTLE: Do you want to amend it?

MR. THIEROFF: I would only like to make a change that there would be a sufficient appropriation allotted so that they would be able to enforce that part of it.

MR. NUTTLE: That is partly covered by the appropriations by the State.

MR. THIEROFF: But not specifically.

MR. NUTTLE: I think the simplest way to handle that would be that some one make a motion that a Committee be appointed to go into the inspection business and report to the next meeting, rather than bring that in here.

The resolution was then carried as read.

64916

Farm Bureau Program

17. We recommend the adoption of the principles and plans for a program of work as enunciated in the President's Annual Address and the Secretary's Annual Report.

We heartily endorse these recommendations and urge that copies of their talks be distributed to our County Farm Bureaus for their guidance and suggestion.

I move the adoption.

Mr. Shillinger, of Talbot County, seconded the motion and it was carried.

Liquor Control

18. A serious condition has arisen since repeal of the 18th Amendment relating to the sale of intoxicating beverages on the Sabbath Day and until 6 A. M. Monday. This situation is objected to by citizens and in many instances by dispensers as well, and has a direct bearing on highway safety. We therefore wish to go on record as opposed to the sale of intoxicants from 12 midnight Saturday until 6 A. M. Monday.

MR. BOLTON: I want to add to this resolution that it be unlawful to give away or sell liquor on a Primary or General Election Day.

MR. NUTTLE: I think that is the law now.

MR. BOLTON: That is a serious matter in our County, and our State's Attorney says it is not the law. At our last election, right within 100 feet of the polls, they were giving whiskey away openly.

MR. ROSENSTOCK, of Frederick County: The whole purpose of the law as to elections was to clean up elections. If liquor were given for the purpose of affecting the voters, it could be reached in that way under the Corrupt Practices Act.

MR. THIEROFF: Is it not true that a lot of these liquor laws are confined to certain counties, and do not cover the entire State?

MR. JOHN: Is it not already unlawful to sell liquor between those hours?

MR. BAKER: I would like to amend this resolution to make it unlawful to sell liquor on the Sabbath and also unlawful to give it away, and collect for it during the week.

No official amendment was offered and the resolution was seconded and passed as read.

Rural Medical Care

19. We heartily endorse the action taken by the American Farm Bureau Federation relative to rural medical care and pledge a continuance of study along that line as instituted by the committee on Medical Care of the American Farm Bureau Federation.

I move the adoption.

Seconded by Mrs. Weagley.

MR. BROOKES: I don't know what that covers. I would like to hear.

Mr. Nuttle called upon Mrs. Weagley, who referred him to Mrs. Giles, from Alabama.

MRS. GILES: We have a woman covering this, an expert, and I would rather you would get that information from her.

MR. BROOKES: That is right down our alley, and we would like to know about it.

MR. SMITH: I would like to say that we understand that the associated women of the Farm Bureau are working on some kind of program, where they can secure through their agencies in their respective committees, all working together to the end that the rural people shall have proper medical care and at reasonable prices.

MR. NUTTLE: Any other remarks? It seems to me to be a step in the right direction.

The resolution as read was duly passed.

DELEGATE: In the new Security Act certain funds have been allotted for rural health work, I think for a National Committee, and it would be well to cooperate with those agencies and see how far they are going and what available provisions are made in that security act for rural health. I think that would be the course to pursue.

Interest Rates

20. We urge our banking authorities to consider the advisability of reducing the rate of interest on short time loans and that a committee be appointed to confer with the Federal and State Banking authorities relative to this important problem.

We particularly urge county Farm Bureau presidents to confer with their local banking officials, looking towards the reduction of the present rate of interest.

I move the adoption.

Mr. Flook, of Frederick County, seconded the motion, and it was carried.

Trailer License Costs

21. We recommend a reduction in the license fee on a small two or four wheel trailer, not used for hire, and used incidentally with a passenger type automobile.

I move the adoption.

Mr. Morris A. Wentz seconded the motion.

MR. CHAFFEY: Does that mean a trailer used by a farmer for carrying his own merchandise?

MR. NUTTLE: Or when you are hauling for your neighborhood and get paid for it.

(There was some discussion as to this which arrived at no conclusion.)

Resolution was passed as read.

Price Level

22. We reaffirm our position in support of the A. F. B. F. in its program for monetary reform, which includes continuance of the President's power to adjust the gold content of the dollar until such time as a permanent monetary authority is provided by the National Congress. We believe that the right time to enact legislation to restore price levels and create a managed currency is now, while the entire nation knows that the need exists.

I move the adoption.

Mr. Brown, of Charles County, seconded the motion, which was carried.

23. In the State of Virginia the use of penal labor in the quarrying and preparation of lime for their soils has materially reduced the cost of lime to farmers. We urge the President of the Maryland Farm Bureau to appoint a committee to secure information on this question with a view, if possible, of having the State Penal authorities of Maryland furnish labor, so that farmers of our state may secure their lime at a more reasonable price.

I move the adoption.

Mr. Linton, of Charles County, seconded the motion, which was carried.

Memorial

24. Since the call of Providence has removed from our midst during the year E. Thomas Massey, an outstanding leader in our organization,

Be It Resolved, that we hereby register our deepest sorrow in the loss of our sincere friend and leader, E. T. Massey, a man of sterling character, a staunch supporter of the organization movement, and a man who was loved by all who knew him.

Be It Further Resolved, that copies of these resolutions be sent to the family of the deceased.

I move the adoption.

Members from all over the room rose to second this motion.

MR. NUTTLE: I think we should pass this by a rising vote. I also think that resolution might be lengthened some. I think it should be longer. It is the aim of the Resolutions Committee to make these resolutions short and to the point, but this should be lengthened.

This resolution passed by a rising vote.

Roads

Mr. Connick suggested that the resolution on Roads be acted upon paragraph by paragraph.

25. We register our disappointment in the progress made in building farm to market roads in this state as authorized by the Federal Works Progress Administration. We believe the delay is due in a large measure to the lack of cooperation between the State Roads

Commission and the Federal authorities. We are anxious that public opinion in this state be awakened to the importance and practicability of eliminating many of our bad country roads through this instrumentality. We therefore earnestly urge our State Roads Commission and our Boards of County Commissioners to make every effort to avail themselves of this Federal aid.

MR. THIEROFF: This road proposition is more complicated than any other matter we have. When I heard this morning there was only one million dollars left for road construction I can very easily see why no WPA work was done on our roads. The State did not have any money to match the Federal money.

MR. CONNICK: In the WPA work the cost of the labor was paid by the Federal Government and the State Roads Commission simply provided the machinery and tools.

MR. PEARCE: Baltimore County has availed itself of this appropriation and in one district alone we built six miles of WPA roads the last year. I don't know why other Counties don't do it.

MR. NUTTLE: There were some built in every county, I think.

MR. PEARCE: Well, there were six built in the 8th District alone.

MR. TURNER: They paid all the cost and furnished one-half of the material. That cut that down.

MR. BOLTON: In Charles County, the WPA told us first thing that we had to use men out of work, and when we had used up all the men out of work we had to import them from some other county. We did that at Indian Head and used up all the labor we had. We could have built that road for less than one-half that the road cost. The trouble is that the WPA work is too expensive. The State Roads Commission is supposed to furnish the equipment, and when the men come and the equipment is not there they are paid for the day; they go home; they have finished their day's work. Now, the people were paying for that kind of service. As far as Charles County is concerned we are not in favor of continuing that.

MR. TURNER: Would you not have had to pay something for those men on relief?

MR. LINTON: The trouble in Charles County is that there are not enough people on relief to carry on the work, and the men come so far to get there on the WPA work.

MR. ROSENSTOCK: The Frederick County Farm Bureau, before our annual meeting, wanted to get the facts, and we had a joint session with the County Commissioners and the WPA people for the Western Shore, and we found the facts as follows: There is ample money appropriated for Frederick County and the other counties on the Western Shore to furnish labor and also an appropriation which has not been used. Frederick County alone had $25,000. However, some friction developed between the State Roads Commission and the WPA people, and the work was not done properly. The State Roads

Commission would not allot the proper equipment, when, as and if necessary to do the work needed. The men would report and there was no equipment; whereas, if the State Roads Commission had furnished the equipment at the time it was needed and was requested by the WPA, we would have gotten our roads done. The reason for the delay has been this friction between the State Roads Commission and the WPA. If we do not use the money allotted to us before the time expires our allotment will go to West Virginia and Virginia, where the people are using it properly. We should do something about it now so that we will get our proper allotment.

MR. CONNICK: We had exactly the same situation in Prince Georges as in Frederick; exactly the same lack of cooperation. The men went out, and they did not have the necessary tools and equipment. That is supposed to be furnished by the State Roads Commission. We have about one-tenth of the amount of work that would have been done. When we wanted a grader, we only got the grader when the State Roads Commission was not using it, and then it was too late. If we wanted a truck for graveling, we might get one after all the work had been done. It just simply looked as though the State Roads Commission did not want the WPA to get the work done.

MR. PEARCE: I think perhaps the trouble is that certain counties in the State are under State control, and certain counties under county control. Baltimore County is under county control, and the State has nothing to do with it.

MR. NUTTLE: And it has worked more satisfactorily?

MR. PEARCE: The County furnished the trucks, etc., everything on the job. Our roads engineer has been very much complimented on his work.

MR. TURNER: I want to say that in Baltimore County we could have had a lot more work done, but the relief labor was not available, out in the rural section.

MR. BOLTON: Let me say for the benefit of Charles County, we were allotted $9,000 for county work, and we have yet to get the first dollar. If you can tell us from Frederick County how we can get it, I wish you would.

MR. NUTTLE: Well, Mr. Rosenstock is a pretty good lawyer. You better hire him to help you.

The motion was carried and the resolution passed as read.

26. We emphatically declare our opposition to the use of any part of the revenue derived from the tax on gasoline for any purpose whatsoever except for the building and maintenance of roads and bridges and service of road debts.

I move the adoption.

Mr. Bolton seconded the motion.

MR. TURNER: I want to offer a substitute motion in place of that (reading)—

There is continued agitation for the use of monies raised from the tax on gasoline and automobiles for the state's general expenses and for other purposes. The farmers of the State are deeply interested in the maintenance and extension of our road system and the preservation of adequate funds for the building of new roads. We hereby express our unalterable opposition to any diversion of the gas tax receipts for purposes other than road construction, maintenance, and road debt service, and urge the recapture of tax funds previously diverted to meet the outstanding need of our road system today.

We hereby endorse our tax committee's report and the facts contained therein pertaining to the distribution of road funds.

I move the adoption of this as a substitute for that second paragraph.

Mr. Connick seconded the motion.

MR. WISE: You will put your resolution in the same form as the others?

MR. TURNER: That is all right. We will get it in proper form.

MR. JONES: How are you going to recapture those funds?

MR. TURNER: It has been the custom every year to re-enact what they have done before.

MR. JONES: I am asking how you expect to get this money back that has been spent?

MR. NUTTLE: You can't.

MR. JONES: He says he wants to recapture it.

MR. WISE: I think he means you have certain taxes for bridges and elimination of road crossings that are now being diverted, also maybe one million is diverted in other ways. What he means by recapturing that is that this should not be done in the future.

MR. JONES: Then he ought to use some other term than "recapture."

MR. TURNER: Well that is the term used.

The substitute motion was carried.

27. As the statute governing the control of county roads by the State Roads Commission expires in the fall of 1937, we recommend the continuance of the maintenance of roads by the State Roads Commission providing that the receipts from the 1½c gasoline tax be apportioned to the counties and the city of Baltimore on the basis of 30 per cent to Baltimore City and 70 per cent to the counties, to be allocated on the basis of the county road mileage in said counties and that legislation of a mandatory character be passed giving to the various boards of county commissioners the power to determine how and where the funds allocated to the counties shall be spent.

I move the adoption.

Mr. Jones seconded the motion.

MR. THIEROFF: That goes a long ways, but it does not go far enough. We should have an investigation. Some of the counties are trying to get their roads back. I don't blame them for that.

We have 24 Roads Commissions in a little state like Maryland. One road commission should be enough. We would have enough trouble with that. The real trouble is that no one county knows exactly how and where the money was spent. In our county we don't know. I would like to see the State Roads Commission furnish each County Commissioner not later than the 15th of the month who got the money, where it was spent and all. There has been dissatisfaction about that expenditure. It should be open for each taxpayer to go and look at it. That would eliminate a lot of trouble with your State roads.

MR. BOLTON: I want to endorse what this gentleman says. We have that same condition in Charles County. Last year $47,000 was spent and the County Commissioners do not know yet who ordered that expenditure.

MR. THIEROFF: We have an organization of County Commissioners all over the State. If they ask for that information they would get it. They are the people who know or should know about it.

MR. MUELLER: Our County Commissioners tell us.

MR. JONES: The present law, as I understand it, is that the State Roads Commission may consult with the County Commissioners. In my county they paid no attention to that whatever, and for that reason I am very much in favor of this resolution to put it in the hands of the County Commissioners and their endorsement be final in the matter.

MR. NUTTLE: There are two questions before us.

MR. ENSOR: The only thought I have is that in the tax report we recommend 70 per cent of the 1½-cent lateral tax, and this section recommends 2 per cent. Don't you think they should agree?

MR. NUTTLE: That half cent is taken off there.

MR. ENSOR: Then your tax report should be amended, or this should be changed. It is not in harmony.

MR. NUTTLE: That half cent is for grade crossings, bridges.

MR. ENSOR: Do I understand that the State Farm Bureau thinks that money should not be available for that purpose any longer?

MR. NUTTLE: In the tax report we advocate more grade crossings.

MR. ENSOR: Those two are not in harmony, they are in conflict. The last few years the railroads have had no money for that purpose. The Federal Government has appropriated for that purpose, and I think it would be very unwise for the Farm Bureau to oppose that. We certainly ought to go on record in favor of eliminating all grade crossings.

MR. JONES: That is the reason we did not have that crossing fixed in Montgomery County.

MR. ENSOR: Just one question. As far as I know, I don't think the counties are in any position to administer that one-half cent for grade crossings. The Federal money is not available and the State funds not available. We don't have them. I think there should be an amendment to that section.

MR. CONNICK: May I say to Mr. Ensor that this one-half cent was not being used for that purpose. It is perfectly all right to change that to conform with the tax report.

MR. ENSOR: I might say that it is proper that one-half cent should be applied to that purpose. I know it has been diverted, but just how much I do not know. I think we should have a resolution to that effect.

MR. NUTTLE: It is one and one-half cents per gallon. Now, we have two things before us in the adoption of this paragraph and we must move along. I am wondering just what we want to do. My thinking was more on the building of roads, whether you want to go as far as you say in that. If you want every cent spent as the County Commissioners say, then there is not much of an administration from the Central Office. If you are going that far, I think they should work together. Then, if you want to do as Mr. Thieroff has asked—have a report of each County Roads Commission by the 15th of the month of what money has been spent in the previous month and where. I do know that the County Commissioners, lots of times, do not know where their balance is—in the red or black. We had in Caroline County a balance of $78,000 when this Commission came in and now we are in the red, and the County Commissioners do not understand it. The big reason is the fact that the center of that flood a year ago was in Caroline County. I think that is the big reason, but our County Commissioners are not sure how that occurred. It seems to me that if the County Commissioners made that request they could get it.

MR. JONES: The situation in my county is just exactly that. The State Roads Commission has gone in there and spent a lot of money, and our County Commissioners did not know anything about it. We found we were some $384,000 in debt to the State Roads Commission, and that money was spent without any real authority in Montgomery County. They allowed a man $50,000 and he went to work and spent $100,000, and that was charged to us. They had no business to charge that to us. It is going to add a lot to our taxes simply because they made that over-draft to the county and we could not check up with our books.

MR. NUTTLE: Well, do you think we should have an amendment to this resolution?

MR. JONES: Therefore, I am in favor of having the County Commissioners have some say as to where this money has been spent

by the State Roads Commission. I think the State Roads Commission can build these roads more cheaply than they did in Montgomery County. They have the equipment, and if the County Commissioners have to take it over they would have to go out and buy new equipment, and that would be somewhere in the neighborhood of $75,000, and if you add that to our present rate of taxes, you would get up in the neighborhood of $2.00 a hundred, more than our people can stand.

MR. NUTTLE: I always thought it was a great thing to have a member of the State Roads Commission from your county, but perhaps I was wrong. Now, has that amendment been voted on?

MR. SMITH: Would you like to change that to read that that one-half cent should be used for elimination of grade crossings?

It was decided to change the 2c to 1½c.

MR. TURNER: I have just noticed something in this resolution on the allotment of that money. It is allocated on the road mileage basis. At present it is on both road mileage and population, is it not?

MR. WISE: It is on mileage now. At the last Legislature they tried to put it on mileage and population and wealth of property, and under that arrangement Baltimore County would get much more and some of the counties on the Eastern Shore might not get much. They did not change it.

MR. THIEROFF: We in Caroline County who live in certain sections do not get the same. Every time the State Roads in Delaware build a good road, over in Maryland they get the same, have to meet that, and the people living over in the other sections do not get as much.

MR. NUTTLE: I happen to live on that side, and Mr. Thieroff does not.

MR. THIEROFF: Well, those things happen.

MR. NUTTLE: Do you want to make a motion?

MR. THIEROFF: I make a motion that the State Roads Commission furnish that information by the 15th of the month.

(N. B. I have no written resolution as to this effect. H. D. S.)

MR. NUTTLE: Now, you have this paragraph as amended.

Resolution carried.

28. As imprisonment as a crime deterrent has proven its futility with some classes of criminals and as employment of convicts in our penal institutions in manufacturing industries is opposed by organized labor and as non-employment breeds insubordination and disorder, we recommend the employment of convict labor in the construction of roads and manufacture and preparation of road materials, the work done by this labor to be supplementary to the regular road building program.

I move the adoption.

Seconded by Mr. Connick and passed.

Bang's Disease

29. Since over 32½ million dollars of Federal money has been expended toward the elimination of Bang's disease, of which over $300,000 has come to Maryland, we support the movement of our livestock and dairy forces in their request for funds to pay state indemnity to Bang's disease reactors and urge the Governor and the Legislature to provide adequate appropriations for this purpose.

I move the adoption.

Seconded by Mr. Rogers and passed.

Meat Animal Importation

30. We oppose the repeal, advocated in some sections, of Section 306A of the Smoot Hawley tariff since such repeal would allow the importation into the United States of meat and meat animals from countries not free from foot and mouth and other similar animal diseases.

I move the adoption.

Seconded by Mr. Jones and carried.

Rural Electrification

31. We are gratified with the progress being made in rural electrification in Maryland through the efforts of the rural electrification educational committee on which the Farm Bureau has representation. We commend to our people the advantages of electric current wherever practical in farm and home operation. We recognize that many farmers who are adjacent to electric service are not using it. We believe that every effort should be made to encourage farm and home service. We desire to express our sympathy with the announced policies of the Rural Electrification Administration, bearing in mind that there are many areas that do not possess the advantages of electrical power. We urge that wherever possible these areas be considered for power extensions as a whole instead of permitting power companies to continue their present policy of extensions only to areas immediately profitable. We favor the extension of power lines to these less favored areas by cooperatives developed with the positive assistance of the Rural Electrification Administration. We also urge upon the Public Service Commission consideration of franchises for unelectrified areas as a whole rather than in part, wherever possible.

We further urge County Farm Bureaus to disseminate information regarding the rural electrification program as widely as possible and to use the present agencies to their utmost.

I move the adoption.

Seconded by Mr. Linton and carried.

MR. NUTTLE: I am a member of that Committee. There were two reasons that made us hesitate to go into the areas—first is that most of the extensions would be under five or six miles and hardly long enough, and we had not considered that; we thought the extensions were short; the other is the tenant problem in Maryland. Every other farm is a tenant farm, and the owner would not electrify. However, if you had been from Washington to Virginia and go down through Caroline County, Virginia, as I did—and I never valued my own county so much—but all along that road they had an electric line running all the way down there. I could not understand how they could have that in Caroline County, Virginia, and not in Caroline County, Maryland. I think we want to get busy on that. I think this resolution is all right.

Appreciation

32. We, the Maryland Farm Bureau in Convention assembled desire to express appreciation to the Honorable Harry W. Nice for his presence at our banquet session, and to Mayor Howard W. Jackson for his welcome to Baltimore.

To President H. C. Byrd of the University of Maryland and to those upon whom he called in making our banquet program an outstanding success go our thanks.

We recognize with gratitude the contributions made to our program by Mrs. J. D. Giles, Morris L. Cooke, W. F. Childs, Jr., Harvey Hull and Chester H. Gray.

We are grateful to the management and staff of the Lord Baltimore Hotel for their fine cooperation and to John T. McCaslin for entertainment.

We extend our thanks also to all those who, as speakers, committee members and workers, helped to make this twenty-first annual meeting such an outstanding success, and especially do we recognize the extra hours put in by President Nuttle, Secretary Wise, and others of the staff of our State organization.

I move the adoption.

Mr. Linton seconded the motion and it was carried.

MR. SMITH: I move an adoption of these resolutions as a whole.

Moved by Mr. Linton, seconded by Mr. Connick. We believe that any special state tax on cigarettes or other tobacco products will operate to the disadvantage of producers of tobacco and we hereby register our opposition to any such tax. Carried.

MR. LINTON: We of Southern Maryland want to express our appreciation of the able assistance of our Secretary down at Annapolis in favor of Southern Maryland.

Mrs. W. W. Hopkins read the following resolution from the Maryland Poultry Council:

WHEREAS, the Poultry Council has conducted the most successful poultry products exhibition in its history, be it

Therefore Resolved, that the Poultry Council expresses its appreciation for the accommodations and courtesy extended by the Farm Bureau and trust that we can continue to cooperate in such educational exhibits.

Chairman Nuttle thanked Mrs. Hopkins and requested her to convey the Farm Bureau's appreciation to the Poultry Council.

MR. THIEROFF: We had a good talk on road planning. I think it was very fine. The Farm Bureau was requested to name a Committee to work out a definite road program for the State, recommending roads that would really affect the rural people. So far, most of our roads have been political roads, regardless of whether they were at the right place or not. Therefore, I make that motion.

Motion was seconded by Mr. Chaffey. Carried.

MR. NUTTLE: I understand there was another motion by Mr. Chaffey about the inspection service in Maryland. He was to offer a motion for a report with recommendations.

DR. SYMONS: At the request of the National Farm Bureau a Committee was appointed to cooperate with other Farm Bureaus with regard to this, and I move the chair be authorized to appoint such a Committee.

MR. WISE: There is going to be a proposition brought before the Legislature that Mr. Turner has already mentioned—this is a Constitutional amendment to prevent the diversion of roads funds. I cannot lay too much emphasis on this at this time. I think a motion would be in order and would be proper to refer that to the Board of Directors for them to take such action as they see fit to protect the interests of the taxpayers and the farmers of Maryland on that proposition.

Mr. Turner offered the motion that the question of Constitutional amendment against the diversion of roads funds to be referred to the Directors with power to act.

Mr. Jones seconded the motion, and it was carried.

Mr. Roy Brookes made an announcement of a dairy meeting at this hotel on Wednesday, the 27th.

Mr. Nuttle called for the report of the Nominations Committee for the succeeding year.

MR. WISE: The Board of Directors met yesterday and instructed the Secretary to place in nomination for President, H. H. Nuttle, for Vice-President, P. C. Turner.

Dr. Symons was asked to take the chair and called for nominations from the floor.

Dr. Bowley moved that the nominations be closed, Mr. Thieroff seconded the motion and it was carried.

Mr. Connick moved that the Secretary be instructed to cast a ballot for Mr. H. H. Nuttle for President.

Mr. Jones seconded the motion and it was carried.

MR. WISE: I hereby cast my ballot for H. H. Nuttle for President for the coming year.

DR. SYMONS: You heard the nomination of Mr. P. C. Turner for Vice-President?

Mr. Cockey moved the nominations be closed. Mr. Weagley seconded the motion and it was carried.

Mr. Weagley moved that the secretary be instructed to cast the vote, and Mr. Jones seconded the motion, which was carried.

MR. WISE: I hereby cast my ballot for P. C. Turner for Vice-President for the coming year.

MR. NUTTLE: I appreciate the honor. I never realized how many friends I have made in Maryland until I lost my Dad in December. If I can be of any service to you people and the farmers in Maryland this coming year I am at your command. Thank you.

MR. TURNER: Mr. Chairman, ladies and gentlemen; I appreciate the honor you have conferred on me. I will endeavor to do my best. The time is short and that is all I can say.

MR. NUTTLE: The next in order is the confirmation of the Directors who have been elected by each county. A motion is in order that the Directors that have been elected by the various counties as our Board of Directors for the coming year be approved.

COUNTY DIRECTORS

Anne Arundel County	C. Ashby Duvall, Parole, Md.
Baltimore County	P. C. Turner, Parkton, Md.
Calvert County	Ellis Bowen, Huntingtown, Md.
Caroline County	Linwood O. Jarrell, Greensboro, Md.
Carroll County	John Bushey, Sykesville, Md.
Cecil County	D. B. McDowell, Nottingham, Pa.
Charles County	Samuel Linton, Riverside, Md.
Dorchester County	A. K. Austin, East New Market, Md.
Frederick County	Wilbert L. Smith, Knoxville, Md.
Harford County	Fred C. Jones, Darlington, Md.
Howard County	Roby Mullinix, Mt. Airy, Md.
Kent County	H. S. Leaverton, Rock Hall, Md.
Montgomery County	J. W. Jones, Rockville, Md.
Prince George's County	W. R. C. Connick, Brandywine, Md.

Queen Anne's County.....John W. Smith, Sudlersville, Md.
Somerset County.....M. F. Carver, Marumsco, Md.
Talbot County.....Francis Shillinger, Easton, Md.
Washington County.....R. C. F. Weagley, Hagerstown, R. No. 1, Md.
Wicomico County.....Claude C. Phillips, Quantico, Md.
Worcester County.....R. E. Shockley, Snow Hill, Md.

Mr. Jones made the motion, but was advised that he was a Director.

MR. JONES: It was entirely an unselfish motive in my mind to make that.

MR. NUTTLE: No one suggests any other motive to Mr. Jones. Nobody does more for the farmers in Maryland than Cy Jones.

The motion was duly made by Mr. Rogers, seconded by Mr. Davis and carried.

MR. NUTTLE: The Board of Directors will meet for dinner, and if there is no objection we will adjourn the meeting of the Maryland Farm Bureau, and convene as the Maryland Agricultural Society. Adjourned 12.10 P. M.

ANNUAL MEETING OF THE EXECUTIVE COUNCIL, MARYLAND AGRICULTURAL SOCIETY

President Nuttle called the meeting to order at 12:10, January 15th, Lord Baltimore Hotel, Baltimore.

Following notice of meeting was read:

TO COUNTY SECRETARIES AND AFFILIATED AND ASSOCIATE SECRETARIES

Dear Sir:

The annual meeting of the Executive Council of the Maryland Agricultural Society will be held Jan. 15th, 1937, at 10 a. m., Lord Baltimore Hotel, Baltimore, Maryland.

Blanks are enclosed for you to submit the credentials for the council members of your organization.

Very truly yours,
C. E. WISE, JR., *Secretary*,
MARYLAND AGRICULTURAL SOCIETY.

CEW:MD
Enc.

Mr. P. C. Turner, chairman of the Credentials Committee, called the roll with the following present:

Anne Arundel County—C. A. Duvall, Roland Leitch; *Baltimore County*—P. C. Turner, G. Wm. Sattler; *Caroline County*—Linwood

O. Jarrell; *Carroll County*—John S. Bushey, Harry I. Rinehart, Geo. B. John; *Cecil County*—J. S. Reisler, R. H. Baker; *Charles County*—S. C. Linton, Bergen Brown, Geo. A. Carpenter; *Dorchester County*—A. K. Austin, A. R. Peterson, S. W. Linthicum; *Frederick County*—Wilbert Smith; *Harford County*—Fred Jones, Frank O. Foard; *Howard County*—Roby Mullinix, Wilson Lord; *Kent County*—H. S. Leaverton, Edward Greenwood; *Montgomery County*—J. W. Jones; *Prince George's County*—W. R. C. Connick, Wm. Ed. Duvall; *Queen Anne's County*—J. W. Smith; *Somerset County*—M. F. Carver, Wm. T. Chaffey; *Talbot County*—Francis Shillinger, Harold Mueller; *Washington County*—R. C. F. Weagley, J. K. Funk; *Wicomico County*—Claude Phillips; *Worcester County*—R. E. Shockley, Willard P. Evans; *Md. State Horticultural Society*—Henry Whiteford; *Md. State Poultry Council*—Mrs. W. W. Hopkins; *Md. Tobacco Growers Assn.*—Oden Sansbury; *Hillsboro-Queen Anne-Coop. Corp.*—T. B. Todd, Jr., Chas. I. Boyle; *Md. Cooperative Milk Producers, Inc.*—Daniel S. Pearce, T. Roy Brookes, Robt. Gist; *Md. Vegetable Growers Assn.*—Joshua Lynch; *Agricultural Corp. of Maryland*—A. G. Ensor, H. H. Nuttle, C. E. Wise, Jr.; *Maryland Farm Bureau Livestock Coop. Marketing Assn.*—Charles T. Cockey, Jr.

Secretary Wise read the minutes of the special meeting August 5th at Betterton.

Motion duly made and seconded that minutes be approved and ordered filed. Carried.

Treasurer T. B. Symons presented the financial statement.

MARYLAND AGRICULTURAL SOCIETY—MARYLAND FARM BUREAU FEDERATION
FINANCIAL STATEMENT FOR FISCAL YEAR 1935-1936

Appropriation for 1935-1936 ..... $3,350.00

Expenditures:

Date	Payee	Classification	Expended
1935			
Oct. 24	H. C. Barker	Travel (Cecil Co., Etc.)	$ 50.31
24	C. E. Shafer	Travel (Sharpsburg to Balto. Live Stock Show)	50.00
24	Md. Farm Bur. Fed.	Office Rent (Oct.)	53.33
Nov. 14	H. C. Barker	Travel (St. Louis)	111.23
14	Md. Farm Bur. Fed.	Office Rent (Nov.)	53.33
Dec. 17	Md. Farm Bur. Fed.	Office Rent (Dec.)	53.33
17	H. M. Carroll	Community Ex. (Harford Co.)	25.00
17	John H. Carter	Community Ex. (Garrett Co.)	47.50
17	H. R. Shoemaker	Community Ex. (Frederick Co.)	25.00
23	P. D. Brown	Community Ex. (Charles Co.)	25.00
23	Horace B. Derrick	Community Ex. (Baltimore Co.)	12.50
23	R. F. McHenry	Community Ex. (Allegany Co.)	25.00
23	Harold A. Remsburg	Community Ex. (Washington Co.)	8.33
1936			
Jan. 22	Torsch & Franz Badge Co.	Office (An. Corn & Potato Show)	14.43
22	Md. Penitentiary	Printing (Programs, An. Meeting)	30.00
22	Mossie G. Bayless	Travel (Balto. An. Meeting)	4.50
22	K. G. Connolly	Travel (Balto. An. Meeting)	5.90
22	Minnie M. Fyffe	Travel (Balto. An. Meeting)	6.35
22	E. C. Weitzell	Travel (Speak. and An. Meeting)	4.00
22	Md. Farm Bur. Fed.	Office Rent (Jan.)	53.33
22	P. D. Brown	Community Ex. (St. Mary's Co.)	15.00

Date	Payee	Classification	Expended
Feb.	3—Md. Penitentiary	Printing (Programs—An. Meeting)	16.00
	3—Henrietta Stonestreet	Printing (Reporting—An. Meeting)	125.00
	3—Arthur R. Weed	Printing (Publicity—An. Meeting)	50.00
	3—Geo. L. Schuster	Travel (Judge—An. Meeting)	21.53
	3—W. C. Dutton	Travel (Speak—An. Meeting)	60.18
	3—Freeman S. Howlett	Travel (Speak—An. Meeting)	39.54
	3—R. S. Brown	Community Ex. (Talbot Co.)	25.00
	3—Geo. W. Clendaniel	Community Ex. (Caroline Co.)	25.00
	3—R. K. Remsburg	Community Ex. (Washington Co.)	8.33
	3—Md. Crop Improve. Assn.	Community Ex. (An. Corn and Potato Show)	176.50
	17—Md. Farm Bur. Fed.	Travel (Chicago An. Meeting)	136.22
	17—Md. Farm Bur. Fed.	Office Rent (Feb.)	53.33
	17—W. S. Wilson	Community Ex. (Pr. Geo. Co.)	14.50
	17—E. Kenneth Ramsburg	Community Ex. (Howard Co.)	25.00
	29—Cent. Pur. Bur.	Printing (Record forms)	.59
Mar.	3—Md. Penitentiary	Printing (Grange An. Rpt.)	163.40
	3—O. W. Anderson	Community Ex. (Montgomery Co.)	15.00
	27—Md. Farm Bur. Fed.	Office Rent (March)	53.33
Apr.	27—Ry. Express Agency	Office (Proof An. Report)	.37
	27—Md. Farm Bur. Fed.	Office Rent (April)	53.33
May	18—Advertisers Eng. Co.	Printing (Cuts—An. Report)	32.75
	18—Md. Farm Bur. Fed.	Office Rent (May)	53.33
June	9—Ry. Express Agency	Office (Proof—An. Report)	.36
	9—Md. Farm Bur. Fed.	Office Rent (June)	53.33
July	7—Univ. Md. Store	Office Supplies	31.25
	7—Md. Farm Bur. Fed.	Office Rent (July)	53.33
	7—G. M. Mizell	Community Ex. (Wash. Co.)	8.33

Date	Payee	Classification	Expended
Aug. 24	Davidson Transfer Co.	Office (An. Reports)	1.74
24	Day Printing Co.	Printing (An. Rpt. Separates)	15.00
24	Margaret T. Johnson	Communication (Postage)	75.00
24	Md. Farm Bur. Fed.	Office Rent (August)	53.33
31	Davidson Transfer Co.	Office (An. Reports)	.59
31	Day Printing Co.	Printing (An. Reports)	785.60
31	T. B. Symons	Other Exp. (Labor, Rpts. An. and Committee Meetings	30.00
31	C. E. Wise	Other Exp. (Labor, Rpts. An. and Committee Meetings	25.00
31	K. G. Connolly	Other Exp. (Labor, An. Rpt., Accts.)	20.00
31	A. H. Snyder	Other Exp. (Labor, An. Rpt., Prog.)	10.00
Sept. 9	C. E. Wise	Travel (S. E. Conf.-Tenn.)	60.00
9	Md. Farm Bur. Fed.	Office Rent (Sept.)	53.37
25	Univ. Md. Store	Office Supplies	1.26
25	M. S. Downey	Travel (Pt. Timon. Ex.)	10.24
25	Dorothy Emerson	Community Ex. (Girls' Clubs)	166.87
25	Southern Hotel	Community Ex. (Plans for Ex.)	36.30
25	Anna Trentham	Community Ex. (Balto. Co.)	12.50
25	Towson Nurseries	Community Ex. (Timon. Ex.)	25.00
	Total Appropriation		$3.350.00

This account is audited by the State Auditor.

T. B. SYMONS,
Treasurer.

Motion duly made and seconded that report be accepted and filed. Carried.

Election of officers. The following officers were nominated for 1937:

H. H. Nuttle for President
P. C. Turner for Vice-President
C. E. Wise, Jr., for Secretary
T. B. Symons for Treasurer

It was duly moved and seconded that the nominations be closed and the Secretary cast a unanimous ballot for the nominees. Carried. Secretary Wise cast the ballot.

Meeting adjourned at 12:40.

PROCEEDINGS

OF THE

THIRTY-NINTH ANNUAL MEETING

OF THE

Maryland State Horticultural Society

Hotel Alexander, Hagerstown, Maryland

January 5, 6 and 7, 1937

The meeting was called to order at 1.45 P. M. by President C. E. Bryan, who called for the report of the Secretary-Treasurer.

REPORT OF THE SECRETARY

A. F. VIERHELLER
College Park, Maryland.

I am pleased to report 208 members, the largest paid-up membership, since I have been secretary of the Society, and believe that we have the majority of large and active growers of Maryland on our membership list. In general, the duties of my office have been concerned with general correspondence regarding problems such as rail rates, pure food regulations pending in Congress, spray residue questions, etc., mostly in connection with requests or instructions from the Eastern Apple Growers' Council, composed of the Horticultural Societies of the East and Middle West. In cooperation with The International Apple Association, and Appalachian Apples, there has been some personal work necessary in making National Apple Week more effective in advertising the apple.

Your secretary has also been active in the Maryland division of Appalachian Apples, Inc., which you all know, is a growers' effort in advertising apples, and is composed of growers from Virginia, Pennsylvania, West Virginia, and Maryland, who are joined together in a voluntary effort to improve the market for their product. As Secretary-Treasurer of the Maryland division, I report that 539,450 bushels of apples have been subscribed in Maryland. There will be some changes in these figures, but they include about 50% of the estimated commercial tonnage of the state. Payments are coming in well, and I appeal to you, to meet your payments as promptly as possible, as

the expense of this plan is going on, and we must back it up. Mr. Miller will report on the progress of this work, during these meetings.

The summer meeting of the Society was held in late July, at the University of Maryland Horticultural Farm, and the U. S. Horticultural Field Station at Beltsville. The day was devoted to inspection of the experimental work at these stations, and there was plenty to see and discuss. We are indebted to the staff of workers of these stations, for their fine cooperation and hospitality. Lunch was served in the log cabin at the U. S. Field Station, and, in general, the growers present declared it the best field day that we had ever held.

Our Society needs the active help of every member. We need more members. Our monthly publication, The Maryland Fruit Grower, needs your suggestions for improvement. We welcome comments regarding our meetings. They are held for your benefit. I hope that this program will be of interest and value. Be sure to visit the educational exhibits of new apple varieties, spray injury studies, disease displays, charts, and bulletins regarding tree statistics, pollination, fruit washing, and general orchard information. Look over the commercial exhibits. Ask questions, enter into the discussions, and make yourself known to the other growers present. There are quite a few visitors from nearby states. We welcome you all to any of our meetings.

REPORT OF THE TREASURER

A. F. VIERHELLER
College Park, Maryland.

On January 1, 1936, we carried over a cash balance of $370.22 and on January 1 of this year, we have a cash balance of $418.29, of which $147.89 is in savings account. There are, however, several bills outstanding, but our balance compares favorably with that of last year. The books of the Society are open for inspection, and I request that our President appoint a committee to audit the accounts for the past year.

The reports were adopted unanimously without discussion.

PRESIDENT'S ADDRESS

C. E. BRYAN
Havre de Grace, Maryland.

President Bryan stressed the point that while the past year was a profitable one for those growers fortunate enough to have a crop, it is important not to allow ourselves to be lulled into a false sense of security. With the next big crop, we will again have over-production, glutted markets, and low prices. He urged all growers to raise

their standards of production, grading and packing, as in a heavy-crop year, only the best fruit stands a chance of returning the cost of production.

Mr. Bryan emphasized the need of more orderly marketing. He pointed out that too large a proportion of the crop is held in late storage, making it impossible to move apples late in the season at a fair price, because of over-supply. He thought it would be better to get a larger volume into consumption early in the season, even at low prices, to make consumers apple-minded, and to relieve the pressure later.

Mr. Bryan noted the fact that while normally apple prices have a close relation to the volume of citrus shipments, this year apple prices had been maintained in spite of the unusually large citrus fruit movement—just an example of the curious fact that people want things when they are scarce. This points plainly to the logic of putting fewer apples on the market, in the fresh state. We should develop by-products for all except the choicest grades of apples.

Mr. Bryan made a strong plea for closer cooperation with the fruit growers' organizations in the neighboring states of Virginia, West Virginia, and Pennsylvania. He thought the interests of growers in the four states are so closely allied, it would be well to have at least one joint meeting so that every one might share equally in the best that each had to offer.

DIAGNOSING THE LACK OF FERTILIZER ELEMENTS FOR ORCHARD TREES

J. H. WEINBERGER, Assistant Pomologist, U. S. Horticultural Field Station, Beltsville, Maryland.

Nitrogen, phosphorus, and potassium are the elements usually thought of as fertilizers for orchard trees. These are the elements that are most often lacking for plant growth in soils in this country. However, there are eight other mineral elements that have thus far been found necessary for the successful growth of a fruit tree. If the soil lacks any one of these, the trees can not survive and definite disorders or symptoms are produced in the tree by which it is often possible to diagnose the cause of the trouble. A fertile soil must necessarily contain an adequate available supply of all essential elements, and most orchard soils in Maryland are deficient only in nitrogen.

In many sections the disorders caused by lack of one or more of these elements are of considerable economic importance. For example, a yellow mottling of the leaves and a rosette of peach, citrus, and other fruit trees in California are cured by applying zinc sulfate to the soil. A similar disorder affects apple trees in Washington and

pecan trees in the South. In South Africa ¼ to 2 pounds of copper sulfate per tree is applied to the soil to overcome chlorosis (loss of green coloring matter or chlorophyll) and rosetting of peach trees. In Florida, die-back of citrus trees is controlled by application of copper salts. Die-back and chlorosis of prune trees in California are associated with deficiencies of potassium in the soil. Leaf scorch of apples in Massachusetts is also associated with potassium deficiencies. In parts of California and Florida manganese is regularly applied to citrus trees to overcome chlorosis. In any part of the country trees on a high calcium soil may suffer from a lack of available iron. Internal cork and certain types of drouth spot of apples are physiological disorders which are associated with nutrition.

It is possible to produce these symptoms of mineral deficiency under controlled conditions. In order to be able to identify them when they occur in the field, one-year-old peach trees were grown in sand supplied with a series of nutrient solution in each of which, one particular element was lacking. In this way definite disorders were produced whose cause could be identified. Most of the observations reported here were made on peach trees grown under controlled laboratory conditions at Beltsville, Md. (7). Description of deficiency symptoms of apples are taken from the reports of Wallace (6) on behavior of trees in the field and in sand cultures.

By far the most important element in the fertilizing of orchard trees is nitrogen. This element is easily leached out of the soil and under Maryland conditions trees respond most readily to applications of nitrogenous fertilizers. When the nitrogen supply in the soil is low the trees lack vigor, terminal growth is short, few leaves are formed, and few fruit buds are differentiated. Leaves are small, yellowish green, much twisted and curled, and develop reddish tints and reddish brown spots. Leaf and blossom buds are slower to open in the spring, and defoliation takes place earlier in the fall. The flowers are weak, often do not set, and if they do set, the fruits are apt to drop. The fruits ripen earlier, are smaller, and usually highly colored. Nitrogen starvation is apt to appear in sod orchards or on shallow soils. It is the most easily controlled deficiency and seldom proves fatal to the tree.

Phosphorus deficiency on fruit trees has seldom been reported under field conditions. When peach trees are grown in pure sand supplied with a nutrient solution lacking phosphorus, they stop growth early in the season, but appear perfectly healthy. The leaves are large, dark green in color, and have a tough, leathery appearance. They lack the bright green color of leaves on a vigorously growing tree. In severe cases shoot growth is small, leaves are small, and defoliation occurs early. Wallace (6) reports that on apples fruit size is reduced, as in nitrogen starvation, but the fruits are poor in

quality and have a dull, bronze finish. In certain soils in England, where the phosphorus supply is so small that pasture plants can not grow healthily, fruit trees show no sign of phosphorus deficiency.

When available potash is scarce in the soil, the effects on the trees are less drastic than from nitrogen deficiency but are more serious because of the difficulty of control. Terminal growth may be just as great on potassium starved trees as on others, but the twig diameter is smaller and the leaves are spaced farther apart, giving the tree a spindly appearance. The distinguishing symptom of potassium deficiency is the "leaf scorch" which develops when the margins of the leaves die, and the dead tissue falls off in ribbons. In the center of the leaf small spots of dead tissue appear also. The leaves are light green in color, smaller in size, and seem thin, brittle, and papery. The edges of the leaves are curled inward. Sometimes a chlorosis appears in the leaves near the margins and between the veins.

With apple trees as reported by Wallace (6), defoliation occurs early, the leaves at the twig tips dropping off first. In severe cases the tips of the branches may die back. Blossom buds are formed and may set, but the fruits are small and of poor flavor. In mild cases, applications of potassium fertilizer to the soil will correct the trouble, but in severe cases recovery is more difficult and often death of the tree results. In any potash fertilization it is important that the fertilizer be placed as close to the roots as possible, since this element is quickly combined in the soil and rendered unavailable.

A simple calcium or lime deficiency of fruit trees does not often occur in the field. Calcium-starved trees grown in sand cultures have large, deep green leaves which tend to be stiff and to roll the edges inward. Late in the season a large area of dead tissue, usually in the center of the leaf, becomes yellow and quickly dies. The injured leaf soon drops off. Shoot growth may or may not be normal. So far as has been observed with apple trees by Wallace (6) bark, blossoms, and fruit are normal.

Magnesium deficiency symptoms are quite similar to calcium deficiency symptoms, except they are more severe, and breakdown usually occurs in areas between large veins. Unless large amounts of iron are available, chlorosis is apt to occur also. Defoliation follows the appearance of breakdown in the leaves, the old leaves dropping off first. New foliage is continually being produced, but it, too, is soon affected and drops off. Apple fruits are woody and fail to mature because of lack of foliage.

Where iron is lacking or is unavailable in the soil, severe chlorosis results. The veins, as well as the areas between the veins lose their green color and may even become almost white before they drop off. The leaves at the tip are lost first, as contrasted to the older

leaves lost first on no magnesium treatment. Lack of iron under field conditions may occur where considerable calcium carbonate or limestone is found in the soils or in the rock from which the soil is derived. Although the soil may be high in iron content, the iron may be rendered unavailable to the trees by the action of the excess lime. Iron chlorosis on peach trees also occurs readily in sand cultures when potassium, calcium, or manganese are lacking and iron supply is low. Under these conditions, if the trees are given either iron or one of the other elements the trouble may disappear.

No disorder of fruit trees due to a lack of sulfur has been reported, and where trees are sprayed with sulfur for the control of diseases, there is likely to be none. However, sulfur is an essential element and fruit trees growing in its absence soon stop growth. With peach trees the terminals die and new shoots start out below the tip, which are small and produce only small light green leaves. These later assume red or orange tints. The older leaves turn light green, resembling low nitrogen leaves, and later large areas of the leaves at the tips or margins die, shrink, and distort the leaves. Defoliation does not occur until late in the season.

Most soils contain ample supplies of manganese, and the cause of manganese deficiency disorders usually lies with certain soil conditions, which render manganese unavailable to plants. High lime content is a common cause, as with iron deficiency. With peach trees, lack of manganese produces a dull, yellowish green color on the leaves. Chlorophyll is lost from the areas between the veins, but not from the veins and the areas adjacent to the veins. Growth is stunted and the leaves drop prematurely.

Internal cork and certain types of drought spot in apples are rather widespread in occurrence and appear to be associated with boron deficiency. Various workers in New Zealand (1), British Columbia, New York, and the U. S. Department of Agriculture (5) have reported success in the control of internal cork and drought spot in apples by the use of one-third to one-half ounce of boric acid placed in holes in the trunk of large apple trees, or by application of one pound of boric acid per tree on the soil. With peach trees in boron-deficient sand cultures, the terminals die back, and lateral buds commence growth, but soon become affected. Small irregularly-shaped areas in the leaf die and drop out. Injured leaves fall off readily. On the stem dark brown corky spots appear, giving it a very rough appearance.

Applications of zinc to fruit trees have been successful in combating a disorder called rosette or little leaf (4). The leaves are small, chlorotic, and branch growth is stunted, giving a rosette appearance. In severe cases the trees will die. This disorder is com-

mon in California in all tree fruits, and also appears in sections of Oregon and Washington, and in nut trees in Southern United States.

Copper deficiency has been observed in citrus trees in Florida, and in apples, peach, and plums in South Africa (2). The leaves become chlorotic, the terminals are rosetted, and the twigs die back. Spraying the leaves with copper, or applying ¼ to 2 pounds of copper sulfate per tree to the soil readily corrects the trouble.

Of the eleven elements whose deficiency symptoms have been described, nitrogen is the one commonly lacking under Maryland conditions. The symptoms of lack of nitrogen are easily recognized. Available potassium is scarce on many of Maryland's orchard soils, yet no cases of severe deficiency and injury have been observed, as has been reported in Massachusetts and Canada. However, with available potassium low and lime content high, injury from lack of available iron may occur on fruit trees on certain soils. It is probably the first deficiency to be suspected if chlorosis occurs.

Physical injuries to trees that produce disorders resembling mineral-deficiency chloroses are common, and winter injury to the crown, mouse injury, or disease, may be suspected when there is a pale or chlorotic appearance. If no injury is apparent on an unhealthy tree, close examination of the nature and degree of chlorosis, the pattern of green and yellow areas, the appearance of dead areas, in the leaf, the progress of defoliation, and the presence of twig injury may provide clues as to the cause of the disorder.

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(1) Atkinson, J. D. Progress report on the investigation of corky pit of apples. The New Zealand Journal of Science and Technology. Vol. 16, No. 5, March, 1935.

(2) Anderson, F. G. Chlorosis of deciduous fruit trees due to a copper deficiency. Jour. Pomol. and Hort. Sci. 10, No. 2, 1932.

(3) Burke, E. Chlorosis of trees. Plant Physiologly 7. 329 (1932).

(4) Hoagland, D. R., W. H. Chandler and P. L. Hibbard. Little Leaf or Rosette of fruit trees. V. Effect of zinc on the growth of plants of various types in controlled soil and water culture experiments. Proc. Amer. Soc. Hort. Sci. Vol. 33, 131-141. 1935.

(5) Magness, J. R., E. S. Degman, L. P. Batjer, L. O. Regeimbal. Effect of nutritional treatments on internal cork of apples. Proc. Amer. Soc. Hort. Sci. 34 (1936).

(6) Wallace, T. Some effects of deficiencies of essential elements on fruit trees. Ann. Appl. Biol. XVII. 649-657. (1930).

(7) Weinberger, J. H., and Cullinan, F. P. Symptoms of some mineral deficiencies on one-year Elberta peach trees. Proc. Amer. Soc. Hort. Sci. 34. 1936.

PRESENT EQUIPMENT AND METHODS FOR EFFECTIVE AND SAFE WASHING OF EASTERN APPLES.

D. F. FISHER, Principal Horticulturist, Division of Fruit and Vegetable Crops and Diseases, U. S. Department of Agriculture, Washington, D. C.

The subject of this discussion could be stated as well in the form of a question, "Are present equipment and methods effective and safe for washing Eastern apples?" In answering such a question one must begin, "It all depends."

It all depends upon the kind of spraying that has been done and the kind and quantity of spray residue that must be removed. Probably for most of the eastern apple crop sprayed in the usual way the answer would be, "Yes, present equipment and methods are effective and safe when properly used." In saying this, reference is made of course to the various types of flotation washers which are probably in more common use than any other kind among eastern apple growers. But an increasing number of growers are not satisfied with the degree of worm control they have been getting from the usual lead arsenate spray program and are resorting to combination sprays of lead arsenate and mineral oil. In such cases the simple flotation type washer is not always effective and the question must be answered in this way, "Effective equipment is available but is not generally installed by growers who are washing apples." Reference is made of course to the flood type washers, brush machines, double process machines, and various combinations of predipping, flooding, and brushing which have come into use in the Pacific Northwest, where doubtless spray residue removal is more difficult than anywhere else in the country. These machines apply from one to three different cleaning solutions, with intervening rinses, and the desired degree of heat may be used in any compartment. Double process, or tandem machines as they are called, have been in use for several years. In 1936 triple process machines appeared and it is reported that in some cases it was necessary to put the apples through these triple process machines twice in order to meet the tolerance. This, however, was in the case of apples that had received the so-called "dynamite spray," lead arsenate, mineral oil, and triethanolamine. "Dynamite spray" is said to be very effective against worms but it builds up a spray residue load that may be ten times as heavy as ordinary lead arsenate sprays, and complicates the residue removal proportionately.

To be used safely, any equipment, whether the simplest or most elaborate, cannot be allowed to run itself. It requires careful and intelligent supervision at all times. It requires an appreciation of the fact that apples are alive, and while like other living things they

can be washed, in doing so they must not be more than momentarily exposed to the corrosive action of powerful chemicals or to injuriously high temperatures.

Spray residue removal is both a physical and a chemical process. Its effectiveness depends upon the interrelation of the concentration of the chemicals, the length of time they are allowed to act, the temperature of the solution and any physical assistance rendered during application, such as agitation of fruit or solution, its detergent action, or any scrubbing which may be employed.

Nor can the differences between varieties be altogether overlooked, or the differences in the same variety from time to time.

Apples can be compared to human beings. Some are hardy, weatherbeaten and tough-skinned, capable of standing a lot of washing. Others cannot stand as much without getting chapped, cracked or chafed. And still others are like the small boy who, after playing around a greasy machine, needs special ministrations and then often escapes with a smudge behind the ears.

The opinion seems to be general that throughout the Shenandoah-Cumberland region, apples were harder to clean during the past season than in previous years. To what extent this conclusion was reached because of a closer check-up on the part of regulatory agencies is not altogether clear, but certainly in some sections at least, they gave greater attention to shipments than in previous years. Likewise, the extent to which it can be attributed to complications growing out of spray practices is not known, but unusual spray programs were responsible in some cases, for serious complications in spray residue removal. However, it is true that even when the same spray practices are followed year after year, the fruit may be materially harder to clean one year than in another. In 1935 we found the fruit much harder to clean than in 1934. In 1934 we concluded that the ordinary crop of apples as ordinarily sprayed could be successfully washed to meet the tolerance by using ½ percent hydrochloric acid without heat or wetting agent in a flotation machine. In other words, it appeared in 1934 that the ordinary crop of apples presented no special difficulty in regard to spray residue removal and that the simplest equipment and methods of washing would suffice. In 1935, however, our results indicated that satisfactorily to clean apples that had received the same spray treatment as the previous crop it was generally necessary to use 1½ percent hydrochloric acid with an effective wetting agent, and to heat the washing solution to 100 degrees in order to get consistently satisfactory residue removal.

Thus far, our 1936 results are not entirely compiled but from the data available it appears that the character of the crop in this respect resembled that of 1934 more than that of 1935. Despite this, however, many growers had considerable difficulty in spray residue

removal, chiefly because of a more complicated spray program and of the long rainless period that prevailed in some areas.

Quite a number of orchards are sprayed with summer oil in combination with lead arsenate. This is done apparently with full knowledge of the fact that difficulty in residue removal may be anticipated, and in the belief that control of worms is the primary consideration. If the infestation is bad enough, especially in a year of good prices, such as 1936, this course certainly would seem to be justified because the difficulties of residue removal are not insurmountable even with machinery now available in the better equipped eastern orchards.

Where the average man fails in meeting such a situation is in not maintaining that careful and intelligent supervision which is demanded. The average fruit packer wants to adopt an empirical procedure which he can use by setting his machinery at the beginning of the season and can then operate successfully by merely pressing a button to start and stop, day by day. Difficult apple washing problems cannot be handled in this way, and it might also be added that such automatic operation is almost too much to expect even when washing presents no special problem. Whenever we have to deal with living things—whether apples or people—we must expect to have to vary our procedure from time to time, depending upon conditions. It is up to us to study and analyze conditions as they develop, and vary our procedure accordingly.

The washing machinery must be adjusted to handle the fruit without bruising or breaking the skin, and most of the workers around packing houses require as much or more of the same kind of adjustment. If the washing solution must be heated, whether by use of live steam, steam coils or otherwise, the first essential is to know at all times how hot the solution is. For this purpose use a tested thermometer. It is not necessary to use an expensive thermometer but it is essential to use one by which the temperature of the washing solution can be determined within a degree or two. So whatever thermometer is used should be tested by comparison with one of known accuracy.

The length of time that apples can be exposed to heated solutions depends upon the nature of the solution, the particular variety, and whether or not the fruit is turgid at time of washing. In general, it appears that when wetting agents are used with hydrochloric acid the apples are more likely to show heat injury than when acid alone is used, also that when a light mineral oil is used in place of the wetting agent in such washing solutions, the apples are less subject to heat injury. Apples are always more subject to heat injury when turgid than after they have wilted a little, so it is always safer to use heated solutions in washing apples from storage, or after they have stood a few days, than it is to wash them immediately after

picking, especially if rainy weather has prevailed during the picking season.

Unfortunately for growers in the Shenandoah-Cumberland region, the York Imperial, one of the leading varieties of apples, is especially subject to heat injury, and the Jonathan is moderately so, especially at time of harvest. Ordinarily, 45 seconds' exposure to an acid washing solution at 110 degrees applied in a flood machine is the maximum that should be used. This is followed immediately, of course, by a thorough cold water rinse. If the temperature is increased above 110 degrees it is necessary to shorten the exposure correspondingly but this may be attended by a lowered efficiency in residue removal. If a longer exposure is required the temperature should be reduced. In a flotation machine a temperature of 100 degrees can ordinarily be used safely for 2½ to 3 minutes. The choice of solution, time of exposure, temperature to be used, and other details of procedure may have to be varied from crop to crop and from time to time. They should be decided upon by adequate experimental runs before the main crop is to be handled. The careful operator will conduct many such experiments, checked by adequate chemical analyses, for his own guidance throughout the season.

In every packing house a competent man should be delegated to supervise the washing operations as his principal responsibility. Unless this is done trouble can be expected sooner or later. A log should be kept of every day's run on every machine and every lot of fruit. Such a record is invaluable in tracing trouble when it arises and affords information by which future operations can be planned. This record should show the composition of the washing solution, the additions to or replacements thereof, the concentration as determined by titrations at 2-hour intervals, the temperature at 15-minute intervals, the speed of the machine or length of exposure of the apples therein, the variety and source of the apples, and finally the analysis of the apples whenever this is obtained, and any observations on heat injury, acid burning or other troubles that may be found.

Considerable confusion arose the past season, particularly in connection with injuries that were found on York Imperial apples. Apples of this variety were frequently found with more or less severe skin cracking, often accompanied by wilting or shriveling and sometimes with secondary rot infection starting at the cracks. When such injuries were reported from the markets it was often impossible to tell whether they had resulted from the washing treatments or had been present as the trouble known as "York skin crack" when the fruit was packed. The shipper, however, usually labored under no uncertainty as to the importance of the trouble whatever its cause, since it meant rejection of many carloads and heavy financial losses in a year when there was a chance to make money.

Because of the prevalence of York skin crack this past year, and because no published description of it has been found, despite the fact that the trouble apparently is not new or altogether unusual, it seems to be worth while to record here some of its characteristics and observations on its occurrence in 1936 and to compare it with the types of washing injury with which it may be confused.

York skin crack develops on the apples before harvest but late in the growing season. If it occurs before growth ceases the cracks may heal over, giving the fruit a russeted appearance. However, it generally becomes more severe as the fruit progresses in maturity, and is usually most severe on the shaded side of the fruit. When the cracks are not healed over excessive wilting may follow. Injury may also result in the washing process since the acid can penetrate to the flesh and is difficult if not impossible to remove by any later rinsing.

This trouble or one very similar to it occasionally appears on other varieties. It has been quite common on Yellow Newtown this past season. However, it is so prevalent on York Imperial as to justify the varietal designation in the name "York skin crack," by which it has been known for many years. From recent observations it appears to occur on fruit grown on trees of comparatively low vitality or affected by drouth conditions during the growing season. It seems to be worse on light crop trees than on those bearing heavy crops. There is considerable evidence that the severity of the trouble is increased markedly by late rains which cause the fruit to swell rapidly. The affected apples usually have a rough, non-waxy skin at time of harvest in contrast to the smooth and waxy finish of normal York Imperial apples.

In this trouble, cracks show a tendency to run in a latitudinal direction but not so generally as in "heat cracking." If there is a worm sting, hail scar or other old injury on the fruit the cracks will usually be found running somewhat concentrically around these. The cracks may make a somewhat wavy line and vary from being barely discernible to being open as much as one-sixteenth of an inch. At first there is no discoloration, but as the cracks become older they may turn almost black, and as the underlying flesh tissues dry out, the skin is pulled loose, giving a bleached appearance, which might be confused with hydrochloric acid injury. In York skin crack, however, areas affected in this way usually have a grayish cast instead of the pale yellow or pallid color which characterizes the acid burning. Moreover, the late stages of York skin crack are more likely to be accompanied by wilting, than is hydrochloric acid injury, and furthermore they are very numerous on certain sections of the apple rather than scattered indiscriminately over its surface. Acid injury is often most severe around the calyx and in the stem basin, but the

bleached stage of York skin crack has been observed only on the cheek of the apple.

Since certain individual trees are often the only ones affected it would seem to be desirable to segregate the fruit from these trees in the orchard. Apples affected with York skin crack are more advanced in maturity than normal fruit and should be packed and handled separately on this account as well as because it is practically impossible to effectively sort out affected apples if they are mixed with the general crop. The cracked skin of these apples renders them subject to decay much the same as any mechanical injury which ruptures the skin.

Hydrochloric acid injury occurs on apples that are allowed to remain in the acid washing solution too long or that are ineffectively rinsed after washing in hydrochloric acid for removal of spray residues. At first affected areas are watersoaked in appearance but later are characterized by bleached, pallid or pale yellowish depressed spots usually in the calyx region, in the stem basin or surrounding lenticels through which the chemical has penetrated. The skin is often slightly torn or cracked in the center of the affected areas due to the corrosive action of the acid, and the spots are generally more sunken than in the case of York skin crack. In hydrochloric acid injury there is likewise no regularity of distribution or general uniformity of outline of the affected areas. The injury can be detected within a few hours after the washing treatment and is clearly apparent within 24 hours.

Heat cracking is likewise produced in washing treatments for removal of spray residues. It occurs when a cold turgid apple is subjected to too long exposure in heated washing solutions. For most varieties of apples 45 seconds' exposure to a temperature of 110 degrees F. is as much as they will stand without resulting heat cracking. The York Imperial appears to be especially subject to this injury, and should be handled accordingly, either by reducing the temperature of the washing solution or shortening the exposure. Heat cracking is characterized by the formation of numerous fine cracks generally arranged latitudinally round the apple. In most varieties the calyx region is especially susceptible and is the first place to look for this type of injury, although it may extend beyond to the cheek of the apple. In the York Imperial, however, heat cracking sometimes appears on the cheek of the fruit and not at all in the calyx region. The cracks appear as fine white lines, clearly visible to the naked eye within 24 hours after treatment although experienced observers can detect the injury almost immediately after it occurs. As the tissues begin to dry out the cracks widen until they assume the general outlines of advanced stages of York skin crack. However, in heat cracking the regularity of location and form is

more characteristic and pronounced than in the other two types. Like the other forms of skin cracking which expose the underlying flesh tissues, the affected apples are subject to early wilting and decay.

CAN THE JUNE DROP OF FRUIT BE CONTROLLED BY THE GROWER?

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Total production in the apple orchard over a period of years may be influenced quite as much by the "June Drop" of fruits, from flowers that have been well pollinated with compatible pollen, as by inadequate fruit bud formation.

While fruit bud formation and fruit setting may not involve the same nutritional conditions, it is probable that that state of vigor which favors an evenly distributed annual fruit bud formation throughout the life of the orchard also favors fruit setting.

On the contrary, excessive fruit bud formation one season followed by failure the next, may be associated with nutritional conditions not favorable to fruit setting.

By "June Drop" in this discussion is meant those fruits that fall in the third and last "wave" of flower and fruit shedding after full bloom.

Petal fall is followed or accompanied by a heavy shedding of blossoms. This first "wave" will include most unpollinated flowers and flowers from the weakest spurs. During the next few weeks a gradual dropping of partially developed fruits occurs. Finally the third or "June Drop" eliminates all fruits that under normal conditions will fail to reach maturity.

Let it be assumed that satisfactory production cannot be expected unless ample provision is made for pollination by bees and fertilization by pollen from the right varieties. Much of the "June Drop" is not directly related to pollination.

The ability of a spur to hold a properly fertilized flower and the resulting fruit depends upon many factors, how many and what factors, we do not know exactly. However, as stated by McDaniels and Heinicke of New York, "Flowers and young fruits are doomed to fall unless they can make active growth during early stages of their development." Any check in this active growth, even if of short duration, is probably sufficient to cause a shift in delicate balances within the spur and tree so that the attachment of fruit to spur is broken and the fruit falls.

Aside from weather conditions as they affect fruit setting, good tree vigor is probably our most important insurance of preventing the excessive dropping of fruits. Trees of good vigor will hold their fruits except under the most adverse weather conditions.

The weather of several preceding years may influence the setting of any crop. Winter injury may weaken the vigor of the tree for more than one year. Severe drought may weaken tree and spur. Any weather condition that lowers the vitality of the tree will lessen its ability to hold its fruit.

Cool, wet weather during blossom bud formation may be favorable to fruit shedding the next season. On the other hand, warm, dry weather during fruit bud formation favors a good set of fruit the following year. Fruits set better in the sunny intermountain valleys than along the foggy coasts. In 1933, Indiana had a very wet cool May followed by drought in June, July and August. A light bloom in 1934 was followed by a heavy dropping of fruits and a poor set. The spring of 1934 was dry and warm. 1935 did not provide the best of pollinating weather, yet an excellent set on a heavy bloom occurred. The dry season of 1930 was followed by an excessive set in 1931 with good pollinating weather.

Cold wet weather during and following bloom is often more serious than late spring frosts. Such weather seems to interrupt active growth sufficiently so that it may not be resumed when favorable conditions return.

While cold wet weather is quite objectionable, high temperatures accompanied by strong winds and excessive transpiration, is equally sure to interfere with a continuous stream of moisture from roots to fruit and only trees in the best of vigor, root and top, will hold their fruits under such conditions.

At first thought it is somewhat difficult to realize that moisture can be a limiting factor in the spring of the year when most soils are wet from winter rains and snows. Nevertheless with high temperatures or strong winds or both, moisture is transpired from the leaves faster than the roots can supply it. This is particularly true where the root system is limited by winter injury, high water table, tight soils or shallow soils. Trees root best and secure a more even moisture supply in deep porous soils. Winter injury to the tops may slow down the flow of moisture through the vessels of the tree. Leaves obtain their supply of moisture first, so that short periods of moisture shortages affect the fruit before the leaves suffer.

We can more easily understand why moisture may be limited by the ability of the tree to supply a constant stream when we realize the large quantities of water that are transpired. In Bulletin 497 of the Cornell Station, it is stated that "On a clear hot day, when the atmosphere is relatively dry, the loss of water per hour may

amount to five or six pounds per 100 square feet of leaf surface, or about 500 pounds for a mature apple tree." This is over 60 gallons per hour. It will require a widely distributed root system and a healthy conducting system to insure a steady water supply. The stream of water must not be broken or reversed for even a short period if the spurs are to hold their fruits.

Perhaps as important as the moisture supply is the food supply. The young fruits draw heavily upon stored foods in the nearby tissues so that only trees that have been vigorous the previous season will provide adequate food reserves. It is also important that the manufacture of food in nearby foliage shall be on a high level of efficiency.

By ringing branches of eight-year-old Grimes Golden apple trees just before their blossoms opened the set was more than doubled at Lafayette, Indiana, in 1931. The spurs on these ringed branches contained a substantially higher sugar and starch content than did check branches that held only half as many fruits.

We are all familiar with the increased set of fruit that usually follows applications of nitrogen fertilizers to mature apple trees. Sometimes ringing and nitrogen applications will increase the set of fruit on different parts of the same tree. It is probably true that neither of these practices would increase the set on trees well supplied with reserves of these organic and inorganic food materials.

These facts emphasize the high levels of food supply both reserves and those currently produced that are needed to insure a set of fruit.

In order to have efficient production of sugars and starches to maintain active growth in the early stages of development we must have foliage of good vigor on the spurs. The 8 to 12 leaves among and below the flowers on the spur have been shown by several workers to be essential for the best set. Reducing this spur leaf area reduces the set in almost direct proportion. Reducing the spur leaf area as late as two weeks after petal fall in Indiana reduced the set in every case.

Analyses of the spur leaves on ringed branches that set fruit on a high percentage of spurs, showed such leaves to be considerably higher in sugars and starch than the same type of leaves on non-ringed branches that set on only half as many spurs.

Emphasis is placed upon these spur leaves for fruit setting because it has been shown by Haller, Magness and others that more distant foliage will mature a crop of well sized fruit. In fact, Aldrich has recently reported that leaves on shoots produced larger fruits than the same leaf surface provided by spur leaves. These facts cannot be questioned for fruits already set but for the small embryo our balances seem much more delicate and the foliage close

by plays a more important role during the period following pollination and fertilization.

In bad scab years these spur leaves may be badly damaged and the fruits will be thinned thereby, as well as by scab attacks on the stems of the young fruits.

Good foliage actively functioning on the spur is a prime factor in determining the ability of a spur to hold its fruit beyond the "June Drop." To provide such foliage, a vigorous tree must be protected against insect and disease damage, by the use of spray materials and machinery that will not damage the leaves.

Dutton in Michigan has shown that lime-sulphur sprays under high pressures, and on over-sprayed trees so injures the foliage as to reduce the set. In 1931 at Lafayette, Indiana, lime sulphur reduced the set on some Grimes Golden trees to 6 per cent of the blossoming spurs, while on nearby check trees the set was 18 per cent of such spurs. Where lime sulphur was used in pre-blossom sprays in Washington, followed with oil sprays eighteen days later, the set was reduced by 50 per cent. This was probably a combination of injuries to the fruit and the foliage.

If we have a limited food supply, competition between blossoms and young fruits may be so severe that nearly all the fruits will fall. This is especially true where with a heavy bloom and favorable pollination, the initial set is high. Frequently less fruit will mature than where the bloom is less or pollination not so favorable. June Drop is usually greater where earlier shedding is proportionately less. It is certain that the percentage of blossoming spurs that set fruit decreases as the number of such spurs increase per tree volume.

Thinning the spurs, the buds, or the flowers has repeatedly increased the number of fruits harvested. Where 80 per cent of pear blossoms were removed by Aldrich in Oregon, the set was doubled. Thinning the flowers by pruning, probably has similar effects as well as affecting the set in other ways.

Late winter or early spring pruning has been shown by Heinicke to increase the set of apples and pears in numerous cases under New York conditions. Such pruning probably leaves a better food supply for blossoming spurs that remain, but it is also probable that it provides a much improved water supply.

Were it possible to maintain a high state of vigor associated with adequate supplies of moisture and foods these artificial means of increasing the set would not be so necessary. Frequently weather and other factors favor a heavy bloom which under favorable spring conditions will set so much fruit initially that the June Drop will eliminate too large a percentage of the fruits. Considerable interest has been shown by growers, facing a "snowball" bloom, in an eco-

nomical means of reducing the number of flowering spurs that will set fruit. According to the reports by Dr. Auchter and his associates, biennial bearing may be influenced favorably by certain spraying practices. However, the thinning of blossoms by such methods followed by adverse weather conditions, apple scab and insect damage may leave little fruit beyond the June Drop. Under more favorable climatic and disease conditions these practices might prove feasible. Many growers prefer to provide the best conditions possible for the fruits to set and then thin off the excess. In 1933 many growers were interested in sprays to reduce the set and aid in fruit bud formation. Over large areas of the middle west, scab accomplished the reduction in all but the most fortunately sprayed orchards.

Perhaps the best index of a tree's ability to set its fruit is found in the character of the spurs on that tree. Plump spurs of good length growth indicate food reserves present, potential functioning of nearby foliage and adequate water conducting tissues. Such spurs will hold their fruits when weaker spurs do not. They also hold fruits with fewer seeds than weaker spurs. Seed content and fruit set as well as fruit size have been shown to be closely correlated. Strong spurs are produced in abundance only on vigorous trees.

The current vigor of the tree is then our best indication of the ability of a tree to set a good crop under the conditions prevailing. The question naturally arises as to why vigorous young trees usually set less fruit than older trees in which fruit bearing is well established. In careful counts of blossoming spurs in Indiana older trees set fruits on from 15 to 30 per cent of their blossoming spurs, while six-year-old trees set on 2 or 3 per cent of their spurs. Ringing branches on these young trees caused as high as 35 to 40 per cent of blossoming spurs to set fruit. Apparently the vigor of the young tree is not that balanced condition that favors fruit setting. It is probable that the demands for sugars and starch in growth extension are so great that not sufficient is left to set the fruit. Were it not for this age difference we could expect older trees, with their greater number of flowers, to set fruit on a smaller percentage of their blossoming spurs.

Trees that are permitted to over-bear in the "on year" are usually so weakened by the heavy drain on the food supply that they not only fail to form many fruit buds but also fail to set fruit on a large percentage of the spurs that do carry fruit buds. Lowered vigor from over-bearing is closely associated with biennial bearing. Proper thinning will aid in delaying the biennial bearing habit.

On trees of bearing age in good vigor, thinning is usually required in seasons of good bloom. Such vigor is built into the tree over a long period of years. Those orchard practices which in a given

region will produce the most vigorous bearing trees are the ones by which the grower can come nearest to controlling the June Drop.

Soil depth to provide a good root system and moisture storage soil drainage to prevent destruction of roots by a high water table and soil management to keep up the supply of organic matter and soil nutrients are all important.

Tillage of bearing orchards may or may not be good practice. Where erosion takes place leaving the trees on mounds or ridges fruit setting is often interfered with due to failure of the root systems to supply needed moisture and nutrients. Maintenance of soil humus to preserve a soil texture that will retain rainfall with a minimum of run-off helps to build vigor into our trees.

Fertilizers, cover crops, or orchard covers, and manures all affect tree vigor. Nitrogen fertilizer in the spring not only improves the set of fruit in the year of application, but gradually improves the vigor of the trees supplying reserves that further insure the set of fruit. As to the best orchard practices for your particular region, I would refer you to your own experiences and to the capable group of men in your experiment station. It is obvious that in a state like Maryland the best practices in the mountain regions would not be best along the eastern shore.

Summary

Fruits set best on trees growing on deep well-drained soils of medium texture. Such soils under proper management readily absorb moisture and permit the development of an extensive root system by which this moisture and the soil nutrients are supplied to all parts of the tree. Nitrogen applications are essential sooner or later and other fertilizers are usually needed to maintain good cover crops. Under such conditions vigorous growth is produced with well developed spurs capable of storing ample reserves and, through efficient foliage, of supplying newly manufactured organic foods by the time reserves are used up. Foliage and tree must be protected with properly timed sprays that produce the least possible injury. Competition between spurs may be reduced by pruning and early thinning of the blossoms.

Vigorous trees will set good crops of fruit in many seasons when less favorably situated and weaker trees and orchards fail to set.

The question in the title of this paper has not been answered. An attempt has been made to show that fruit will not fall as readily from vigorous trees of bearing age as from weaker trees. Insofar as the grower can control a well balanced vigor in his trees he can control the June Drop except under the most adverse weather conditions.

DETAIL PRUNING TO ASSIST IN THE PRODUCTION OF BETTER APPLES.

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All fruit growers have pruned bearing apple trees with the knowledge that a tree left unpruned sooner or later presents a tangle of growth that results in many serious ill-effects in growth and fruiting of the tree as well as interfering with the orchard operations. Poor fruit color, weak growth of shaded spurs, and a dense, crowded condition of growth and foliage have been commonly noted in unpruned orchards to say nothing of the poor control of insects and diseases because the dense trees prevented a thorough spray coverage. Most fruit growers readily recognize when a tree becomes too dense and usually pruning is done annually or at least biennially to prevent the occurrence of a too dense condition. With pruning as an old accepted orchard practice, the main question in the problem is the manner or the "how" of pruning which is used to keep the trees from becoming too dense or which is used to remedy the situation when a tree becomes too dense.

One reads and hears most frequently the general advice on pruning "to keep the tree open" or "open up the tree" which is good advice as far as it goes but the manner in which this advice is translated and put into practice often results in serious damage to the tree and its productiveness. One mistake is the removal of large branches with the consequence of large holes which give a false appearance of openness. The remaining branches although somewhat better exposed to light still have the same density. Another disadvantage of pruning by removal of large limbs lies in the reduction of the fruiting area of the tree, which is reflected in lower yields. Occasionally a large limb must be removed where limbs are crowding but in general the large cuts should be avoided. Too often lower limbs on a bearing apple tree are sheared off in a wholesale manner in the name of pruning.

The more desirable pruning makes use of small cuts, distributed over the tree, thus the term "detail pruning" is used to denote the method of many small cuts in detail rather than a few larger cuts. The time necessary to carry out the detail pruning obviously is much greater, but experiments and experience of growers have shown that its use is necessary to avoid or correct a dense tree growth. The more liberal use of nitrogenous fertilizer to stimulate growth and production of fruit trees has placed greater emphasis on the use of detail pruning, since trees now become more quickly filled with growth than in former years when nitrogen was used more sparingly. However, the detail pruning is not an indiscriminate distribution of small

cuts under present day conditions, since our knowledge of how a tree grows and fruits has given a better basis for the selection of the wood to be removed. The type of wood to be removed is the most important consideration in modern day pruning, and makes it necessary for the pruner to distinguish the relative growth conditions of the branches of an apple tree, as well as to know the fruiting habits of the tree.

One rule in pruning that still holds good is *not to make any cut without a reason for that cut.* The main difficulty with application of the rule is *to know* the reasons which determine the cuts. If we use the method of small cuts to open the tree the pruner must learn to recognize the *weak wood,* that is, branches which have made relatively poor growth of terminals and spurs and small diameter in proportion to the age of the branch, and in comparison with adjacent branches. The small diameter has led the Michigan Agricultural Experiment Station recently to term this type of wood "thin wood," hence the term "thin wood pruning." Such branches often are produced under shaded conditions and thus are apt to be found as so-called "hangers" on the lower side of the main limbs. During the growing season with a ripening crop on the trees, these "hangers" are best identified, bearing poorly colored, undersized fruits and sparse foliage. This wood bears a large part of the cull apples. Hence, if a pruner learns to recognize weak wood, this knowledge will constitute the main reason for the majority of his cuts.

The good fruiting wood that remains after the removal of weak wood necessarily must be thinned out with small cuts, *if* the tree is too dense for efficient coverage of sprays or for adequate light conditions for coloring of the fruits. The best guide for the amount of such thinning lies in the experience of the grower under his conditions with the several varieties. One error that should be avoided is excessive thinning in the tops of the trees where much of the better fruits are borne.

Another caution in the use of detail pruning is not to cut back to lateral branches except occasionally on lower branches when the ends of the branches have become weak in growth. Cutting back the branches of bearing trees, even though the cuts are small, may result in the forcing of a large number of spurs into twig growth or even water-sprout growth so that the tree becomes markedly more dense, not to mention the loss of bearing spurs. Particularly, in the top of the tree, cutting back will produce a dense growth condition that is hard to correct in succeeding years, and casts a canopy of shade over the rest of the tree. If an upright branch in the top of the tree is not cut back or even thinned out, it eventually bears sufficient fruit to bend that branch permanently in a lower position, whereas cutting back such a branch will not permanently lower that branch but may

even make it higher if water-sprouts develop vigorously at the point of the cut.

In experiments with detail pruning in Maryland since 1922, the results in growth and yield have been observed and recorded, as well as the effects on color and grade of fruit. The growth of terminals and spurs was greatly stimulated except when nitrogen was not supplied to trees under sod conditions. Under conditions of nitrogen deficiency, pruning had little effect on growth and only served to reduce the fruiting area. Little pruning was necessary to keep the tree open with such trees limited by nitrogen. In the other cases where nitrogen was not limiting, the most extreme type of detail pruning did not reduce the yielding capacity of the tree. However, excessive thinning of wood did result in the production of oversized fruits. The most desirable effects were the increased color of fruits and the better grade of fruits due to better spray coverage and the elimination of the small poorly colored fruits by the removal of the weak wood.

TABLE I. EFFECT OF PRUNING ON SIZE OF FRUIT AND YIELD OF YORK IMPERIAL APPLES.

	Percentages of Fruit in Sizes				Yields
	2¼"	2¼"-2½"	2½"-3"	3"-up	8 yr. total per tree
Light Detail Pruning	10	33	42	15	93.2
Moderate Detail Pruning	2	22	56	20	89.7
Heavy Detail Pruning	4	25	53	18	91.9

Table I shows some results of pruning comparisons, which are illustrative of the beneficial effects of detail pruning on size and grade of fruits without sacrifice of yield. In the most drastic removal of wood by detail pruning of York Imperials used in an experimental way over a period of years in which the tree presented a very much skeletonized appearance, the yields were not decreased. However, such very severe pruning resulted in oversized York fruits that were not as salable as smaller fruits. Hence, the amount of detail pruning after removal of weak wood must be determined by the grower's experience.

In dealing with a dense tree that has not been pruned for a season or two, it is best to spread the pruning over two or three seasons to reach the point of best results in improvement of size and grade of fruit. In this way some undesirable effects are avoided, especially in growth response of the tree as well as fruit character.

SPRAY INJURY DISCUSSION. RECENT EXPERIMENTS TO PREVENT SPRAY INJURY IN VIRGINIA, PENNSYLVANIA, WEST VIRGINIA, AND MARYLAND.

Virginia Experiments

NOTES ON SPRAY INJURY STUDIES IN VIRGINIA

W. S. HOUGH, Entomologist, Winchester Research Laboratory, Virginia Experiment Station, Winchester, Virginia.

(Presented by A. B. Groves in Dr. Hough's absence.)

Work on spray injury and its control has been in progress in Virginia for some time. The influence of various sulphur and copper fungicides has occupied the attention of Dr. A. B. Groves for the past several seasons while I have attempted, through orchard experiments, to reduce spray injury with special reference to arsenical injury. My experiments began in 1925 and have been continued to date. Some helpful information has been obtained, but the fact that we are studying and discussing spray injury today is evidence that this problem is far from being solved. For the sake of brevity I shall summarize the practical information that has been obtained to date under Virginia orchard conditions.

Sulphur fungicides.—Sulphur sun-scald may follow the use of sulphur in hot weather. The sulphur-scald or burn may occur if the spray is applied while the temperature is high or if a period of high temperatures follows soon after an application of sulphur, even though the weather was cool when the spray was applied. Lime-sulphur usually causes more sulphur-burn or russeting than wettable sulphur, but even wettable slphur can injure apples in extremely warm weather. The addition of lime may reduce, but does not prevent sulphur burning or russeting on apples in hot weather. Under our conditions sulphur sprays are usually not safe after the first cover spray and in some seasons after the calyx spray. A mixture of half-strength lime-sulphur and some wettable sulphur may not be any safer than lime sulphur alone, at least that has been our experience. Under our conditions the most satisfactory procedure seems to be to use lime-sulphur on scab-susceptible varieties in all pre-blossom sprays and also in the calyx spray unless the season happens to be especially unfavorable for scab. As a rule, wettable sulphur should replace lime-sulphur in the first cover spray. On such varieties as Jonathan, Yorks, Ben Davis, Gano, etc., wettable sulphur is usually preferable to lime-sulphur in the calyx spray as well as in the first cover.

Copper fungicides.—Up to the present time Bordeaux mixture is still the standard fungicide used beginning with the second cover

spray, which usually comes around the first week of June. Coposil with lime appears to be safe when substituted for Bordeaux mixture at this time of the year and leaves less visible residue than the Bordeaux. We regard all other copper sprays as being in the experimental or developmental stage as far as they concern our conditions, and in this connection it should be added that quite a number of copper sprays have been used during the past three seasons in orchard experiments.

Arsenical injury.—Quite a number of materials have been used during the past 12 years in attempts to control arsenical burning on fruit and foliage of the apple. About six years ago this same problem in our peach orchards was solved by the use of a corrective, composed of zinc sulphate and lime. We are still hopeful that an equally satisfactory corrective may be found for apple trees. I shall mention briefly the more important correctives tried for reducing arsenical injury on apple fruits and foliage.

Bordeaux mixture.—Under our conditions this is the most efficient and most satisfactory corrective that we have used. The one criticism that is usually offered against Bordeaux mixture is that it may cause copper injury. As a corrective it is effective when used at the 1-2-100 dilution.

Lime.—Not consistently effective in wet weather. As the amount of lime increases, the effectiveness of the arsenical insecticide tends to decrease.

Zinc sulphate and lime.—Excellent corrective but usually causes severe zinc russeting on certain varieties such as Winesap, Grimes, Stayman, York, Delicious and others.

Zinc hydroxide and lime.—Same results as given for zinc sulphate and lime.

Casein.—Usually used as calcium caseinate. Not any more consistent than lime.

Ferric oxide.—No advantage over lime. Leaves conspicuous residue.

Ferrous sulphate.—Used in combinations of lime sulphur and lead arsenate. No better than lime as a corrective. Leaves black residue.

Fluxit.—About same as lime as a corrective.

Glutrin.—Not a corrective.

Calcium sulphate.—Less effective than lime.

Manganese sulphate.—Not effective at the rate used, namely 3 ounces per 100 gallons.

Fish oil soap and lime.—No more effective than lime but may offer the advantage of reducing the amount of lime required.

It frequently happens that our unsprayed check trees show exactly the same type of side russeting as sprayed fruit, but as a rule there

is more of the russeting on the sprayed fruit. Side russeting may be caused by low temperatures early in the season, frequently when the blossom clusters are showing pink. The application of spray materials usually increases the amount of the russeting after adverse weather conditions has injured the epidermis or skin of the young fruits. Side russeting is usually attributed to the caustic action of the fungicide, but in a few instances we have observed the same effect where lead arsenate was used alone. Lead arsenate, however, is less likely to cause side-russeting than the more caustic fungicides. Arsenical injury most frequently appears as a blackening of the calyx end of the fruit and as marginal burning of the leaves. Black rot in the calyx end may be mistaken for arsenical injury sometimes. For some reason, weak trees are considerably more susceptible to spray injury of all kinds than vigorous trees of the same variety.

Pennsylvania Experiments

SPRAY MATERIALS IN RELATION TO SPRAY INJURY

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It is obvious to all of us that the ideal fungicide for the spraying of apples is not yet at hand. Such a fungicide should be toxic to plant disease fungi, and at the same time non-injurious to the apple tree. But in addition to these, we demand a fungicide that is cheap and convenient to handle, not poisonous to men or animals; that will cover easily and stick well, that will not build up toxic residues in the soil and one that will mix with the various insecticides. Our present standard spray formulas have all these properties in considerable degree, and yet fall short of the ideal very largely because of the too great amount of injury which they produce under certain conditions or upon certain apple varieties. It is this matter of spray injury that I wish to consider with you.

Our two great groups of fungicides, the sulphurs and the coppers, are both injurious under certain conditions, much as we regret to admit it. The mechanism by which a fungicide kills the spores of a parasitic fungus is the same as that by which it produces injury to the foliage or fruit of the apple tree. The very properties in a fungicide that are the basis for its high disease control seem to be the same properties that are also responsible for its injurious effects. The choice of a fungicide and the building of a spray schedule must involve, therefore, a balance between efficiency of disease control on the one hand, and spray injury on the other. Thus it often appears that a gain in either of these objectives is accompanied by a corresponding loss on the other side of the balance.

To determine what a fungicide will do, it must be tested in the field. Such tests should be made on varieties susceptible to fungous disease for the sake of determining fungicidal efficiency, and they should also be made on varieties susceptible to injury for the sake of determining the safety factor. Field tests must be repeated two or more years to determine the effects of seasonal variations, which are beyond the control of the experimenter. Before reporting on the detailed results of some of these tests as they have been conducted in Pennsylvania perhaps I should emphasize the complicated nature of what we call spray injury.

Sulphur sprays frequently cause a fruit russet. This may be aggravated early in the season by late spring freezes and unseasonable cold weather. It may also be aggravated by hot weather later in the season, as was the case this past year. Foliage injury appears as brown dead spots, as yellow leaves and as early defoliation. Copper may also cause a fruit russet and foliage injury, usually rather distinct from sulphur injury. Injury from lead arsenate or calcium arsenate adds a further complicating factor. In any test of materials it is desirable to separate these various factors as far as possible. The aim of field tests should be to furnish a detailed analysis of the behavior of the better fungicides—to learn just what can be expected from each one in the way of disease control, to learn what type and how much injury may be expected and under what conditions this injury is most likely to appear. It is only from such an analysis that we will be able to synthesize, or put back together again, a more ideal spray schedule. Such a schedule, as I see it, does not necessarily use one fungicide throughout the season but may call for two or three different fungicides at different times, depending upon the season. The ideal schedule is no longer a fixed and definite thing, no longer the same for everyone or the same for all varieties of apples, or even the same in successive years. I have no such ideal schedule to propose. I have only the results from some field tests which I hope make some contribution to the type of analysis I have mentioned, and in that way perhaps contribute also to a firmer foundation for the future.

CHART 1

Comparison of Fruit Russet on
Stayman Apple — State College, Pa., 1935-1936

Treatment of Plots

Treatment & Plot No.	Sprays Applied
1. Lime Sulfur	Standard
2. Lime Sulfur	1 to 75
3. Lime Sulfur	1 to 100 plus 4 lbs. Catalytic Sulfur

Pre-Bloom
4. Lime Sulfur—Standard
5. Lime Sulfur—Standard

Pre-Bloom & Petal Fall
6. Lime Sulfur—Standard
7. Lime Sulfur—Standard
8. Lime Sulfur—Standard
9. Check—No Spray

Petal Fall and 3 Covers
Flotation Sulfur 5 lbs. to 100 gal.
Dry Lime Sulfur 4 lbs. to 100 gal.

Three Cover Sprays
Bordeaux 2-6-100
4 Lbs. Copper Phosphate, 8 Lbs. Lime, 4 Lbs. Bentonite
2 Lbs. Coposil, 3 Lbs. Lime
No Spray

Results

Fruit Russet—1935
Sulfur plus Spring Freeze

Treatment & Plot No.	Percent Russet
8	54.0
5	53.7
4	53.7
6	51.7
3	50.5
7	49.5
1	49.5
2	38.7
9 Check	4.2

Fruit Russet—1936
Sulfur plus July heat

Treatment & Plot No.	Percent Russet
1	19.9
5	15.8
2	9.9
3	9.3
4	5.3
9 Check	1.2
6	0.6
8	0.0
7	0.0

CHART No. 1. This chart shows fruit injury on the same trees, in the same orchard, sprayed with same sprays in two successive years. It provides a good example of the combined effect of seasonal conditions and sulphur sprays in producing fruit russet on a variety susceptible to this type of injury. In 1935 the injury was the result of the combination of sulphur with a late spring cold snap. Of the three sulphur plots comparable at this time (pre pink and pink) the one receiving dilute liquid lime sulphur (Plot No. 2) was the only one that significantly reduced the injury. That this injury was not due to the cold weather alone is shown by the lack of such injury on the unsprayed check trees. That the injury was not appreciably increased by the later sprays is indicated by the very small difference between plot 1 and those plots which received mild or substitute materials in the later applications. 1936, however, tells a different story. In this year the fruit russet was brought about by sulphur in combination with the unusual July heat. Plots 6, 7, and 8, which received no sulphur after petal fall, escaped this injury almost entirely, while plot No. 4, which received flotation sulphur in the petal fall and cover sprays is significantly the best of the sulphur plots. The season of 1936 was especially favorable in bringing out and emphasizing the difference between sulphur sprays with regard to this type of injury.

CHART 2

Comparison of Fruit and Foliage Injury
Stayman Apple — State College, Pa., 1936

Treatment of Plots

Treatment & Plot No.	Spray Applied
1. Lime Sulfur	Standard
2. Lime Sulfur	1 to 75
3. Lime Sulfur	1 to 100 plus 4 Lbs. Catalytic Sulfur
Pre-Bloom	Petal Fall & 3 Covers
4. Lime Sulfur—Standard	Flotation Sulfur 5 Lbs. to 100 Gal.
5. Lime Sulfur—Standard	Dry Lime Sulfur 4 Lbs. to 100 Gal.
Pre-Bloom & Petal Fall	Three Cover Sprays
6. Lime Sulfur—Standard	Bordeaux 2-6-100
7. Lime Sulfur—Standard	4 Lbs. Copper Phosphate, 8 Lbs. Lime, 4 Lbs. Bentonite
8. Lime Sulfur—Standard	2 Lbs. Coposil, 3 Lbs. Lime
9. Check—No Spray	No Spray

Results

Plot & Treatment No.	Per Cent Fruit Injury	Plot & Treatment No.	Per Cent Foliage Injury
1	19.9	1	29.1
5	15.8	2	25.3
2	9.9	5	20.9
3	9.3	3	20.5
4	5.3	4	17.9
6	0.6	6	16.9
7	0.0	7	15.5
8	0.0	8	14.4
9	1.2	9	3.1

CHART No. 2. This is a further comparison of the same series of sprays as shown in Chart No. 1, but permits, for 1936, a comparison between fruit injury and foliage injury. The figures on foliage injury were arrived at by counting the leaves on 25 terminals chosen at random from each tree. Records were kept of leaves which had dropped as indicated by leaf scars, of those which showed blotch or marginal burning and of those which had turned yellow. The percentages here presented represent the sum of these injuries and the average of four replicates for each treatment. It will be noticed that the differences between treatments are not so pronounced on the leaves as they are on the fruit, and yet the four best materials appear in the same order. The three plots receiving copper compounds in the cover sprays show the least injury to both fruit and foliage, and Plot No. 4, which received flotation sulphur at petal fall and in the covers, is next best.

CHART 3

Comparison of Fruit and Foliage Injury in a Mixed Block of Stayman and Black Twig Apple.
Sachs Orchard, Adams County, Pa., 1936.

Treatment of Plots

Treatment & Plot No.	Sprays Applied	
	Before Bloom	After Bloom
1.	Lime Sulfur 1 to 40	Lime Sulfur 1 to 50
2.	Lime Sulfur 1 to 40	Magnetic Sulfur 8 Lbs. to 100 Gal.
3.	Lime Sulfur 1 to 40	Flotation Sulfur 5 Lbs. to 100 Gal.
4.	Lime Sulfur 1 to 40	Sulcoloid 10 Lbs. to 100 Gal.
5.	Lime Sulfur 1 to 75	Lime Sulfur 1 to 75
6.	Lime Sulfur 1 to 75 plus Magnetic Sulfur 4 Lbs. to 100 Gal.	Magnetic Sulfur 8 Lbs. to 100 Gal.
7.	Lime Sulfur 1 to 100 plus	Magnetic Sulfur 4 Lbs. to 100 Gal.
8.	Lime Sulfur 1 to 100 plus	Catalytic Sulfur 4 Lbs. to 100 Gal.
9.	Lime Sulfur 1 to 100 plus	Flotation Sulfur 2½ Lbs. to 100 Gal.
10.	Lime Sulfur 1 to 100 plus	Sulcoloid 5 Lbs. to 100 Gal.

All plots received Three Cover Sprays containing Fungicides

Results

Treatment & Plot No.	Per Cent Fruit Injury	Treatment & Plot No.	Per Cent Foliage Injury
1	27.2	1	61.9
9	16.4	5	55.9
5	13.3	2	54.6
7	12.3	9	52.9
10	3.9	6	52.0
6	3.6	7	51.5
2	3.4	3	51.1
8	1.9	10	49.3
3	0.4	8	47.9
4	0.3	4	47.4
Check—No Spray	0.0	Check—No Spray	17.4

CHART No. 3. Presents a second experiment conducted in a commercial orchard in Adams County, Pennsylvania, and involves a comparison between 10 different forms or combinations of sulphur and an unsprayed check. The figures represent averages of 12 replicates for each treatment. Both sets of data were secured by counting fruit and leaves on the trees during August, 200 fruits and 25 terminals per tree were counted. Since the crop was a light one, the fruit counts represent almost the entire crop. As in the experiment at State College, it will be observed that the differences between these materials were brought out very nicely in the case of fruit injury, but were not nearly so pronounced on the foliage. The foliage injury was high on all the plots, running to 17.4% on the unsprayed check. This leaf injury to the check trees was due largely to the attacks of cicada (locust) and

was emphasized by the hot weather, which doubtless in part explains the high percentage of foliage injury on all the plots. These figures indicate more severe injury on both foliage and fruit than was experienced by the average grower. This was brought about deliberately by including sulphur in a larger number of sprays than was recommended to the growers by our Spraying Service for the sake of making clear any differences in the relative safety of the kinds of sulphur used. Three schedules were followed. The first using liquid lime sulphur before bloom and various milder sulphurs in the cover sprays. The second using a more dilute liquid lime sulphur fortified with a wettable sulphur throughout the season. In the third, two strengths of liquid lime sulphur were used throughout the season. In the first group (Plots 2, 3, 4 and 6) flotation sulphur and sulcoloid appeared slightly safer than magnetic sulphur for use as cover sprays, though the differences were slight and probably not significant. In the second group (Plots 7, 8, 9, and 10) it appears quite definitely that liquid lime sulphur 1-100 fortified with either flotation sulphur or magnetic sulphur was definitely more injurious than the same strength of liquid lime sulphur fortified with either catalytic sulphur or sulcoloid. Flotation sulphur used in this way was decidedly the worst of the four. In the third group (Plots 1 and 5) the dilute liquid lime sulphur was, of course, safer than the standard strength. Of the three safest sulphurs as measured by fruit injury, two also appear among the three safest as measured by foliage injury.

If the story so far appears to place standard liquid lime sulphur in the most unfavorable position with regard to the amount of injury produced, it should be kept in mind that the disease control factor has not here been compared in value.

CHART 4

Comparison of Fruit and Foliage Injury on Jonathan Apple.
Sachs Orchard, Adams County, Pa., 1936.

Treatment of Plots

Treatment & Plot No.	Sprays Applied	
	Total Lead Arsenate	Total Fungicide—First 2 Covers
1.	15 Lbs.—5 covers	10 Lbs. Flotation Sulfur
2.	15 Lbs.—5 covers	10 Lbs. Flotation Sulfur
3.	15 Lbs.—5 covers	10 Lbs. Flotation Sulfur
4.	15 Lbs.—5 covers	12 Lbs. Elemental Sulfur
5.	6 Lbs.—2 covers	12 Lbs. Elemental Sulfur
6.	6 Lbs.—2 covers	4 Lbs. Coposil
7.	6 Lbs.—2 covers	4 Lbs. Coposil
8.	6 Lbs.—2 covers	8 Lbs. Copper Phosphate
9.	None	10 Lbs. Flotation Sulfur
10.	None	10 Lbs. Flotation Sulfur

Results

Treatment & Plot No.	Per Cent Fruit Injury	Treatment & Plot No.	Per Cent Foliage Injury
8	37.6	4	72.3
6	20.5	3	69.5
7	19.1	1	67.8
10	7.4	2	67.1
1	6.4	5	35.0
4	6.2	6	26.7
3	5.3	7	26.3
2	5.1	8	25.1
9	5.0	9	11.6
5	3.6	10	10.9

CHART No. 4. These data on spray injury were secured from some plots laid out primarily for the purpose of testing materials and schedules designed for codling moth control. They are of interest here because of the light they threw on the effect of lead arsenate in complicating the general picture of spray injury. The figures shown in the first three charts were all taken from experiments where the amounts of lead arsenate were equal on all plots for the season and the kind or amount of the fungicide provided the variable factor. These trees were sprayed uniformly by the grower up to and including petal fall. Our experiment involved five cover sprays, with no fungicide after the first two. In this series, the foliage injury in particular is shown to be in direct relation to the total amount of lead arsenate used in five cover sprays.

Plots 1, 2, 3, 4 received a total of 15 pounds of lead and show twice as much foliage injury as plots 5, 6, 7, 8 which received a total of only 6 pounds of lead. Correspondingly plots 9 and 10 which received no lead in the cover sprays show less than half the injury of the plots which received 6 pounds. Comparing plot 5 (where the fungicide used was sulphur) with plots 6, 7, and 8 which had the same amount of lead, but with copper as a fungicide, we find that the use of sulphur increased the amount of foliage injury.

The fruit injury was negligible except on the copper plots. In this experiment both coposil and copper phosphate were used without excess lime, the lime having been omitted for two reasons, first, because it is known to interfere with the best results from lead arsenate, and second, to find out just how injurious these two forms of copper might be, when used without lime. At the rate of application used, the copper phosphate actually contained six times as much copper as the coposil so it is not surprising to find it producing the greater amount of injury. The difference in fruit injury among the other plots is not believed to be significant.

CHART 5

Comparison of Scab Control versus Sulfur Injury.
State College, Pa., 1935-1936.

Results

Spray Treatments	Sulfur Russet, Stayman 1936	Scab Control McIntosh 1935
Lime Sulfur—Standard—All Sprays	19.9%	10.0%
Lime Sulfur—1 to 75—All Sprays	9.9	13.5
Lime Sulfur—1 to 100 plus 3 Lbs. Catalytic Sulfur—All Sprays	9.1	8.5
Lime Sulfur—Standard, Flotation Sulfur, Petal Fall plus 3 Covers	5.3	15.0

CHART No. 5. In this chart an attempt is made to picture the behavior of four sulphur spray schedules as tested for a two-year period on two different varieties of apples. Here we attempt to balance fungicidal efficiency, as measured by scab control on a scab susceptible variety (McIntosh) in a bad scab year (1935) with injury produced by the same spray schedule on a variety susceptible to sulphur russet (Stayman) in a year (1936) when such injury was pronounced. It will be noticed that, in general, as the injury has been reduced the amount of uncontrolled scab has been increased. The one exception is a combination of 1-100 liquid lime sulphur fortified with so-called catalytic sulphur and used throughout the season. Needless to say we consider this a most promising material and if it continues to prove worthy in other seasons and in the hands of other experimenters it will no doubt find its place. This sort of comparison also shows one of the reasons why the uniform spray program has lost considerable of its uniformity in recent years. It is definitely possible to use a safer form of spray on varieties that are very susceptible to sulphur injury provided only that they are not at the same time extremely susceptible to scab.

CHART 6

Comparison of Scab Control versus Copper Injury, McIntosh Apple
State College, Pa., 1935-1936.

Spray Treatments Early Sprays thru Petal Fall Standard Liquid Lime-Sulfur	% Scab on Fruit 1935	% Copper Russet on Fruit 1936
Three Cover Sprays:		
1. Bordeaux 2-6-100	17.0	8.6
2. Coposil 2 lbs. to 100 gal. Hydrated Lime 3 lbs. to 100 gal.	28.0	0.17
3. Copper Phosphate 4 lbs. to 100 gal. Hydrated Lime 8 lbs. to 100 gal. Bentonite 4 lbs. to 100 gal.	8.7	4.0

CHART No. 6. Spray schedules designed to give a maximum of scab control in the early sprays and a maximum of safety from injury in the cover sprays have led to an increasing use of Bordeaux cover sprays.

In Pennsylvania we have not generally recommended Bordeaux cover sprays but we are interested quite definitely in the possibilities of finding a copper spray as effective as Bordeaux and less productive of copper injury. This chart shows two years' results with three of these copper sprays used as cover sprays, following standard liquid lime sulphur through petal fall. The figures are from the variety McIntosh which is not particularly susceptible to copper russet but they give a good idea of what may be expected in the way of scab control. Had the copper russet been measured on a variety like Ben Davis our injury figures would doubtless have been much higher, but presumably the three materials would have maintained the same relations to each other.

Bordeaux could doubtless have been made to give better control, but when, as here, it is used weak enough to avoid excessive injury the control is not satisfactory. Coposil used as recommended by the manufacturer evidently does not contain sufficient copper either to control scab satisfactorily or to produce injury. Copper phosphate has definitely reduced copper injury when combined with Bentonite and lime and has stood up well from the point of view of scab control.

From the figures presented it becomes evident that each one of the principal ingredients of the common spray mixtures are apt to produce serious injury. Such injury cannot at present be entirely avoided if the purpose of spraying is to be accomplished. It is evident that a careful adjustment of spray schedules to varieties and to the main disease and insect problems in any orchard must be made in such a manner as to take into account both control and injury. In many cases excessive injury can perhaps be avoided without too great a sacrifice in control.

West Virginia Experiments

WEATHER AS A FACTOR IN CAUSING SPRAY INJURY

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After listening to the interesting reports presented by Dr. Groves and Dr. Thurston, you are aware of the fact that the spray injury problem is being studied in a systematic manner in the Appalachian apple belt. The main reasons why all this emphasis is being placed on spray injury studies in recent years, are, firstly: larger spray

machinery used at high pressures and frequently resulting in over-spraying, and secondly, a much more critical apple inspection system than was in vogue ten or fifteen years ago. Growers who have been in the business for ten years or more agree that the large size spray units equipped with pumps delivering from 25 to 40 gallons per minute at pressures up to 500 pounds, result in much heavier spray coverage than was possible with the smaller spray units of the last decade. In this apple belt in 1922, all the apples were packed in barrels and apple growers did not find it necessary to use their conscience regarding the quality of the fruit packed. Prices were high and it was possible to sell even inferior grades of apples at a profit. All of you know that it is different now. Since our discussion concerns spray injury, it might be well at this time to discuss briefly some of the main factors involved in spray injury.

Some of the Factors Involved in Spray Injury

Temperature and Humidity—It is generally agreed that temperature and humidity are probably the most important considerations in spray injury. Most of you expect sulphur burn when you spray in very hot weather and you also expect copper russet if you use Bordeaux during cool wet weather. It is generally believed that a temperature of 70 degrees and a humidity of about 60 percent, accompanied by slight air movement, constitutes an ideal weather condition for spraying. I shall dwell more fully on this later.

Orchard Elevation and Topography—Those of you who have orchards in hilly parts of the state realize that air drainage is necessary to prevent frost pockets into which cold air will settle and cause frost injury. Such frost pockets, as well as orchard corners bordered by dense woods, affect wind movement and are important considerations in the spray injury problem. The spray liquid will not dry as readily in such a pocket as on a well drained slope, especially if spraying is done early in the morning. The time required for drying spray liquid on leaves and fruits is directly correlated with spray injury.

The Age of Fruit—We have found that apple fruits can be injured at any time during the growing season, but that they are more susceptible in the early stages of growth when the skin is quite tender and the cuticle development is not as advanced as in later stages. As the fruit ripens, it becomes less and less susceptible to spray injury, but we should bear in mind that at no stage in the growth of an apple is it immune to spray injury.

Tree Vigor—The importance of tree vigor in relation to susceptibility to spray injury has been given much emphasis in recent years. We are now generally agreed that trees in low vigor resulting from lack of fertilization, root injury and heavy incidence of disease in

previous years, are particularly susceptible to both fruit and leaf injury. Unless special efforts are made to regain the vigor of apple trees, they will become more and more susceptible to spray injury. It is, therefore, of great importance to apple growers not only from the standpoint of profitable production, but also in the prevention of spray injury, that proper cultural practices be followed to insure high vigor of all trees in the orchard.

Varieties—I need not dwell on the varietal susceptibility of apples to spray injury. Practically every apple grower knows the varieties that are most susceptible, such as Ben Davis, Gano, Golden Delicious and Grimes. The most resistant varieties in our apple belt are York, Stayman, Winesap, Northwestern Greening and Black Twig. It is probable that in the next ten years, we shall give more attention to individual varieties instead of considering the orchard as a unit in selecting spray materials.

Rainfall—Continuous rainfall has a tendency to soften foliage and to some extent fruits, thus predisposing them to injury by both copper and sulphur containing fungicides and arsenicals. It is for this reason that spray applications made immediately after a prolonged rainy period are frequently followed by spray injury. During periods of drought when leaves and fruits contain less than normal amounts of water, spraying also causes injury.

Combinations of Spray Materials—We know that summer oils cannot be used with sulphur fungicides. Even when a summer oil application is made on trees previously sprayed with lime-sulphur, injury usually follows. Wettable sulphurs cause comparatively little injury when used alone, but in combination with calcium arsenate, they frequently cause severe injury which can be largely eliminated by the addition of chemical hydrated lime in the amount of twice the weight of the arsenical. Certain spray materials are not compatible when used in combination with others and the spray services of the various states in this apple belt give consideration to this incompatibility in formulating spray recommendations.

In the cooperative work on spray injury undertaken by the four states represented in this discussion, the West Virginia studies were largely along the line of the various weather factors that influence spray injury. We realized at the outset that a record of weather conditions as applied to our regular spray program of five or six sprays had serious limitations. We, therefore, undertook to select as many unfavorable weather conditions as possible during the season and made our applications with a special knapsack sprayer at a pressure of 140 pounds, using individual branches as a spray unit. We made 71 spray applications on five of our common apple varieties, using most of our common fungicides and arsenicals. Bear in mind that we deliberately selected weather conditions usually considered

to be unfavorable for spraying, in the hope that we could cause spray injury. Our program was not one of spray injury prevention but rather to cause spray injury. We feel that if 100 spray applications are made during unfavorable conditions over a period of four of five years, we could then catalogue these conditions and correlate them with injury that may follow the use of various spray materials. After one year of experience along this line of study, I am keenly aware that the spray injury problem is an extremely difficult one and that many more factors are involved than the average grower realizes. This is a problem that will make the most enthusiastic research man humble and for that reason I would advise every fruit grower in this apple belt to expect slow progress.

My thought regarding the spray injury problem is that it will take years of diligent study to even partially solve it because the fundamental difficulty lies in the fact that fungicides of high toxicity also are highly caustic. In other words our most effective fungicides cause the most spray injury under certain conditions.

Whenever we made an application with a certain spray material to an individual branch, we kept very careful notes of weather conditions, particularly temperature, humidity, sunshine, wind velocity, age of fruits and the time required for the spray material to dry. We prepared individual charts for each branch sprayed much after the fashion of clinical charts for patients in a hospital. I think you may be interested to have me present part of the data from some of the more interesting of these 71 clinical charts prepared in 1936. After giving you these data, I shall take up the discussion of various types of spray injury.

Record No. 1—Sulphur Shock—

(1) On May 8 an application of 10 qts. lime-sulphur 1 to 40, 3 lbs. lead arsenate and 6 lbs. lime per 100 was made at 400 lbs. pressure to a block of York trees.

(2) Application made in morning at 70° and humidity 70%. During afternoon temperature rose to 90° and humidity dropped to 50%.

(3) During second day maximum temperature 90°, minimum 60°, maximum humidity 98%, minimum 40%. During third day maximum temperature 73°, minimum 62°, maximum humidity 98%, minimum 69%.

(4) Weather was clear with slight wind movement.

Results

Lead injury apparent on second day. On third day severe injury was evident. All sprayed leaves stopped growing—they were paralyzed and never resumed growth. On June 1, 22 days after spraying, large percentage of leaves were yellow and by June 5 all injured leaves had

fallen. Thus 27 days after spraying all leaves had dropped. Check trees showed no dropping.

It is evident from this observation that the conditions immediately prevailing during a spray application are not the only consideration, but that weather conditions during the three or four days following a spray application are just as important.

Record No. 2—Using Lime-Sulphur at High Temperatures—

On July 10 after our spraying season ended, lime-sulphur 1-40 was applied to Yorks, Ben Davis, and Grimes at 140 pounds pressure, temperature 105°, humidity 30%. No perceptible wind movement. Spray liquid dried mostly in 6 minutes and totally in 11.

Maximum temperatures of following 4 days were 104, 96, 93, and 103.

Minimum temperatures of following 4 days were 68, 69, 67, and 68.

Maximum humidity of following 4 days—96%, 98%, 98%, and 98%.

Minimum humidity of following 4 days—28%, 30%, 36%, and 40%.

Weather clear and very hot, fruits half grown.

Results

York, no fruit injury after 9 days, slight leaf injury. Finally, 10% fruit injury, slight leaf injury. Stayman—no fruit injury, 70% leaf injury. Ben Davis—slight fruit injury, 80% leaf injury. When lead arsenate was added, injury in all instances was reduced.

We expected 100% of injury to fruit and foliage following the use of a sulphur fungicide at such extremely high temperatures, but the data indicate otherwise. It is through such records as these that we realize how difficult it is to make definite statements regarding ideal weather conditions for spraying.

Record No. 3—Delayed Injury Following Bordeaux Spraying—

(1) On July 2 an application of 4-4-50 Bordeaux was applied to a block of Grimes, Bens and Stayman trees at a temperature of 88°. During the previous 48 hours the humidity was nearly 100%. Spray applied with a power sprayer at 400 lbs. pressure.
No injury was noted until July 30 when leaf yellowing began.

(2) By August 17 severe leaf yellowing and defoliation occurred amounting in some instances to 60%. No such injury occurred in check trees or trees sprayed with ZO and Fungicide 66 on the same day.

In this instance 45 days elapsed before maximum injury developed.

The rainfall during this period was 1″ below normal and temperatures were above normal.

The information presented in Record No. 3 throws light on this interesting phenomenon of delayed injury and may explain such occurrences in your own orchards.

Record No. 4—Does Pure Water Cause Injury?

There is a simple theory advanced by certain workers that spray injury during warm clear weather may be caused by the functioning of droplets of spray material as lenses, resulting in the concentration of the sun's rays as through a burning glass. This idea sounds good and plausible but it happens in our test that it had no basis in fact as the following data seem to indicate.

(1) An application of pure water was made on Grimes, Ben Davis, Stayman, York and Winesap on June 2. Temperature 94°, humidity 25%, clear hot day. Fifteen minutes required for complete drying. Fruits about 1″ in diameter—no injury of any kind.

(2) Same varieties were sprayed July 10, fruits nearly half grown. Five applications on 5 successive days at temperatures of 105, 104, 96, 93 and 103. Same branches were used in 5 applications. No injury of any kind to fruits or foliage.

Types of Apple Spray Injuries

I shall discuss various types of spray injury following the use of different spray materials. Lantern slides will show these various types of injury. I have here ten small baskets of different varieties, showing most of these injuries. I also have forty-five collections of spray injury on leaves of apples, caused by a large number of spray materials, and hope that all of these materials will help to clarify the spray injuries found in your orchards.

Sulphur Injuries—When concentrated lime sulphur is diluted with water, the active toxic element in this fungicide is mostly calcium polysulfide CaS_5 and calcium thiosulphate both in true solutions. Lime-sulphur should contain no free sulphur. It is now generally believed that this soluble sulphur which may be absorbed by the tissues of leaves and fruits, particularly if small injuries occur, is the main cause of the so-called lime-sulphur injury. We speak of "burning out" of scab infection by lime-sulphur. This is due to the absorption of these soluble sulphurs by the scab lesion which is a weakened part of the leaf due to the fungous invasion. Wettable sulphurs and dry lime-sulphur are less injurious because they contain very little or no soluble sulphur and for this reason they are not as toxic as lime-sulphur solution. There is no reliable method known at present to reduce sulphur injury, when lime-sulphur is used alone. It is a notable

fact which some of you may have observed, that lime-sulphur in the early growing season causes much more injury to leaves than to fruits. When lead arsenate is added to lime-sulphur, a reaction occurs between the soluble sulphur and the lead arsenate resulting in the formation of soluble acid calcium arsenate, black lead sulphide, free sulphur and water soluble arsenate. It is this release of water-soluble arsenate which causes arsenical injury to fruits in the petal-fall and first cover sprays. This combination of lime-sulphur and lead arsenate also results in a lessening of leaf injury from the soluble sulphurs because a considerable portion of these soluble sulphurs are precipitated.

Hydrated lime is added to the lime-sulphur and lead arsenate combination to neutralize the soluble arsenate and also to slow up the formation of some of the compounds mentioned above. It is advisable to add the lime-sulphur first, followed by the proper amount of hydrated lime and to delay the addition of the lead arsenate to the very last. The best policy is to mix the lime-sulphur and hydrated lime with water and add the lead arsenate immediately before beginning the spraying operation. After this triple spray combination has dried on the leaves and fruits, the lime continues to delay the chemical action incident to weathering, thus reducing injury. When lime-sulphur without any other material added to it is sprayed on leaves and dries, the soluble sulphurs are immediately oxidized resulting in a film of extremely fine free sulphur together with a small amount of gypsum. This finely divided free sulphur constitutes the chief fungicidal property of the spray residue. During hot weather it is this fine free sulphur which causes sulphur burn.

Sulphur injury manifests itself in three common forms, namely: fruit russet, sulphur burn of fruits and foliage and sulphur shock of leaves. Depending upon high temperatures, lime-sulphur burn has been found to occur within 48 hours after application. Sulphur russet is somewhat slower in appearing. Probably the most important injury caused by lime-sulphur is lime-sulphur shock to young leaves, as previously described.

Whenever lime-sulphur is used in the early season, the foliage usually develops a typical leathery, half-dried condition and rarely recovers. There is at present probably no better fungicide for the control of apple scab than lime-sulphur, but in years of light scab prospects, it seems inadvisable to use lime-sulphur at the concentration of 1-40. In such years, it is advisable to use wettable sulphurs which will likely control the disease and cause less injury.

Copper Injury—Under the conditions prevailing in the Appalachian apple belt, it is inadvisable to use Bordeaux mixture even as weak as 1-1-50 for any application previous to the first cover spray. Bordeaux mixture properly prepared is probably the best all-round fungicide

available. Its use, however, is limited to warm weather, when the sulphur fungicides cannot be used. Copper injury manifests itself in the form of fruit russet, leaf scorching in the early season and leaf yellowing followed by defoliation in the late season. The russet pattern on different fruits has no general similarity, occurring as it does in both the netted and the solid type of russeting. On certain varieties like Stayman and King David, sulphur injury first appears as purplish discolored areas which finally become black, and for which we have designated the same "black pinhead injury." At this time, it might be said that regardless of the cause of spray russet, it is impossible by examining the russetted fruit to say whether this russet was caused by sulphur, copper, arsenicals or other spray materials. A careful study of this was made during the growing season of 1936 and with the exception of the black pinhead type of Bordeaux injury, it was found impossible to identify any spray russet on fruits as resulting from any particular spray material. Under our conditions, certain varieties like Golden Delicious should never be sprayed with Bordeaux mixture because severe russeting usually follows. The appearance of Bordeaux or copper injury is considerably slower than injuries caused by sulphur and arsenicals.

Arsenical Injury—We have seen that arsenical injury is caused by water-soluble arsenate which is released particularly when lead arsenate is used in combination with lime-sulphur. When calcium arsenate is used alone, severe leaf and calyx-end injury follow within 5 days after the application. Lead arsenate used alone is not nearly so injurious. The safest method of using calcium arsenate and lead arsenate is in combination with Bordeaux mixture. The average Bordeaux mixture used in this country contains a large excess of lime which makes it unnecessary to add hydrated lime as in the case of lime-sulphur.

Fruit Russeting—Fruit russet is the commonest spray injury noticed by the apple grower. Leaf injury may occur but as soon as the leaves have dropped, the orchardist seems to forget what happened. Fruit russet, however, persists and causes much grief, particularly when an otherwise clean crop of apples is thrown out of grade by the presence of this injury. The average grower knows very little regarding the fundamental cause of fruit russet and for this reason I shall give a brief discussion of the development of this important spray injury.

A section cut through the skin of an apple reveals several layers of different cells. On the outside of every apple is a layer of waxy substance known as the cuticle. Beneath this layer of wax occurs the first layer of cells known as the epidermis. Beneath the epidermis we find from 4 to 6 layers of irregular cells known as collenchyma and beneath this layer we have several layers known as the paren-

chyma. I use these scientific terms because it is the only method of accurately describing the anatomy of the outer portion of an apple fruit.

Whenever the cuticle is injured as a result of a spray application, mechanical injury or low temperature, the first cell layer of the epidermis is exposed and is also injured and frequently killed. When this occurs, the cells of the collenchyma take on a very unusual function, namely; the production of corky tissue on the outside, which is the plant's method of reducing water loss through the injured area. It is this brown corky layer replacing the epidermis which is known as russet. It is self-evident that russet when it once occurs cannot be removed. Russet injury is more noticeable on the yellow colored fruits than on the red. In fact, on a variety like Ben Davis, slight russeting may be more or less blended out or at least made less noticeable as the red color develops. Extravagant claims have been made by certain commercial concerns regarding their powdered Bordeaux mixtures and other copper fungicides in the prevention of russet. I have tested practically all of the well known proprietary copper fungicides on apples and I have not found one of them which will not cause fruit russet when used under certain conditions.

We have now seen some of the reasons why spray injury occurs in our orchards and we realize that the main factor involved is weather, over which we have no control. In the large commercial apple belts of the East, the spray programs follow a time schedule. Certain sprays must be applied within certain time limits because fungous diseases and insects wait on no orchardist. It is evident to all of us that the fruit grower has only a small leeway in selecting suitable weather for spraying. During wet weather, conditions are favorable for disease development but unfavorable for codling moth. Since we do not usually spray during wet weather, it is obvious that such weather is favorable to the fruit grower if he has a good fungicide coverage on his trees.

The search for new fungicides and correctives for lime-sulphur, arsenicals and Bordeaux mixture is now being diligently made by experiment station workers and commercial concerns. All of us realize that the basis of our commonest fungicides is sulphur, copper and lime. The study of additional metals like zinc, aluminum, iron and manganese to combine with lime, copper and sulphur as correctives or in entirely new fungicides may result in reducing spray injury. When we develop a new toxic fungicide that will not cause spray injury under any set of conditions, our spray problem will have been largely solved and the time and money spent for this purpose is well warranted at this particular time.

Maryland Experiments.

SPRAY INJURY INVESTIGATIONS

H. S. MCCONNELL, Associate Professor of Entomology, and
E. J. ANDERSON, Associate Pathologist, University of Maryland,
College Park, Maryland.

This discussion presents the preliminary work of the Maryland Experiment Station on spray injury. The results were secured by the cooperative efforts of the Botany, Horticultural and Entomology Departments for one season. The experiments were conducted in two orchards near Olney in the southeast portion of Montgomery County. Since the varieties in the two orchards are different, and conditions within the orchards are different, they will be referred to as the Bowdler orchard and the Boyd orchard. Neither of the orchards would be considered as representative of commercial orchards. In general, they would be classed as orchards with low fertility, and the trees rather weak. The Bowdler orchard is in sod with a heavy growth of Japanese honeysuckle and poison ivy beneath many of the trees, which has been conducive to much mouse injury. The Boyd orchard was cultivated until recently, but at present the ground is grown up in weeds.

The Bowdler orchard is planted to Stayman, Grimes and a few Delicious, but only Stayman and Delicious were used. The Delicious plots are not included in this report. The trees are about twenty-five years old and range from small to large in size. The indications are that systematic light pruning had been practiced for some years, but large limbs have been permitted to grow and droop until in many cases the lower ones touch the ground. In full foliage these limbs form a tent over the ground beneath the trees. These conditions made effective spraying operations quite difficult, and are probably responsible for the poor scab control secured as will be discussed later.

The Boyd orchard is planted to Stayman, Delicious, Grimes and Golden Delicious. However, only Grimes and Golden Delicious blossomed and set fruit. The orchard is about fifteen years old, and the portion used has made only fair growth during this time. The trees range from small to medium in size, trained to a modified central leader system, but it has been several years since they have been pruned at all. As a result the trees, except small ones, are very dense when in full foliage. The density of the trees made it difficult to spray the inner portions without over-spraying the outer portions which resulted in fruit and foliage injuries by hard spraying.

Neither of these orchards bore any fruit in 1935 or 1936. As a result the codling moth carry-over was quite light, but by the end of the season, the population had built up considerably in portions of

the orchards that were not sprayed. Unsprayed trees in the Bowdler orchard had about 35% of the fruit damaged by codling moth at harvest time while in the Boyd orchard only about 20% was injured at harvest. Scab control was poor in both orchards regardless of how vigorously the spray schedule was applied. By late July, the unsprayed trees were about 50% defoliated on account of scab.

The spray program used in these experiments was confined primarily to the materials commonly in use in the state. The insecticides used were lead arsenate, calcium arsenate, and two nicotine-bentonite combinations, which are being tested as substitutes for arsenicals. The fungicides used were lime-sulphur, bordeaux and Coposil. Spreading and wetting agents used were casein, fish oil soap and white oil emulsion. These insecticides, fungicides, and spreaders were used in various combinations of schedules, that called for certain sprays to be added to, or eliminated from, the standard schedules. The combinations resulted in a total of sixty-nine plots that had from four to six trees per plot. The above spray materials were used throughout the experiments at the following rates:

Lead arsenate—3 pounds to 100 gallons of water.
Calcium arsenate—3 pounds to 100 gallons of water.
Nicotine-Bentonite (155-0)—3 pounds to 100 gallons of water.
Nicotine-Bentonite (155-X)—5 pounds to 100 gallons of water.
Bordeaux mixture—4-8-100.
Wettable sulphur—12 pounds to 100 gallons for early sprays.
—8 pounds to 100 gallons for cover sprays.
Lime sulphur (conc.)—1-40 (full bloom sprays 1-60).
Coposil—2½ pounds to 100 gallons.
Fish oil soap (25%)—1 pint to 100 gallons water.
Casein—½ pound to 100 gallons water.
White oil emulsion—½ gallon to 100 gallons water.

The equipment used in applying the sprays is typical of that used in present day commercial practice. The spray machine is capable of providing a wide range of pressures, however, all plots were sprayed at the same pressure for any particular application. The early applications were made at 500 pounds pressure, and the cover sprays at 350 pounds. Therefore, within certain limits, the sprays were applied to all plots at comparable pressures. Under the conditions that the work was done this year, the same operators were not always available which introduces a variable that was undesirable but unavoidable. The tops of the trees were sprayed from a tower eight feet above the ground.

The above discussion indicates the conditions under which the first year's work was done.

Before taking up the matter of spray injuries, a short discussion

will be devoted to scab and codling moth control. Under the conditions the 1936 experiments were conducted, scab control in all the plots was very poor, regardless of the materials used or the number of applications made to the trees. This condition was probably due to heavy infection in those two orchards, since they had not been sprayed for at least two years. Some of the plots received lime-sulphur 1-40 in the prepink and pink stages, 1-60 in full bloom, and 1-40 again in the petal fall spray, yet poor control was obtained. In some cases 4-8-100 Bordeaux was used for the full bloom spray. Under the conditions prevailing in these two orchards both lead arsenate and calcium arsenate gave satisfactory codling moth control, regardless of the number of spray applications. Three covers was the minimum, and five the maximum number of arsenical applications. Control of codling moth with nicotine-bentonite combinations were much less effective than with the arsenicals.

Spray Injuries

Spray injuries encountered in these experiments may be considered as falling into five groups. The degree of injury within a particular group was quite variable, and in some cases difficulty was experienced in determining to which group an injury should be referred.

The effects of wettable sulphur on finish of fruit will be discussed first. Complete schedules with wettable sulphur were applied to three varieties, namely, Golden Delicious, Grimes and Stayman. In the early sprays, prepink, pink, full bloom, and calyx sprays, it was used at the rate of 12 pounds per hundred gallons of water, and during the cover sprays at the rate of 8 pounds per hundred gallons of water. In all cases the insecticide used was arsenate of lead three pounds and casein one-half pound per hundred gallons of water. Serious injury to fruit and foliage occurred during the excessively hot period early in July. This condition was noticeable in the form of scald in about four days after the early July application was made. Some defoliation occurred, apparently due to the sulphur injury to the foliage. The finish of fruits on Golden Delicious and Grimes that were not scalded was the best for all treatments on these two varieties. The Stayman wettable sulphur plots produced few apples that were not culls, due primarily to scab on the fruit and serious defoliation due to scab. The wettable sulphur plots averaged only slightly higher fruit infections than other plots, but fruit counts do not accurately portray the difference in scab control between wettable sulphur and lime sulphur since the number of scab spots were more numerous on wettable sulphur sprayed apples, and a greater portion of the foliage dropped.

The most serious injury encountered was that produced by the

combination of Coposil and nicotine-bentonite on Grimes and Stayman. There was some evidence of injury to fruit and foliage on these varieties in late July and early August. At this time the injury was typical of that produced by copper sprays. The edges of the undersides of the leaves became pinkish and rolled slightly upward. The Stayman fruits had reddish slightly raised spots on the sides, while the Grimes fruit had a dot-type russet on them. By harvest time these symptoms on Stayman fruits had disappeared, apparently due to masking by the high color they developed. The dot-type russet persisted and was perhaps accentuated at harvest. The most serious injury by this combination of Coposil and nicotine-bentonite occurred in the stem ends, where the "normally russeted" area became darkened (often quite black) and cracked; often several deep cracks occurred on the same fruit. The darkening of this area was first noticed late in August and increased in intensity until harvest. The area of the apple involved in this condition was no greater than that found on fruit from other treated plots or from trees that received no sprays at all. Which of the two materials in this spray combination was responsible for this condition could not be definitely determined, and it will require another year's work to arrange combinations that will definitely fix responsibility for the injury. About 75% of the fruit from these plots had stem end injury varying from slight to very severe.

There were two types of injury peculiar to the Stayman variety, one occurring at the calyx and the other on the sides of the apples adjacent to the stem cup. The calyx end injury was what is generally referred to as soluble arsenic injury. It occurred on all Stayman plots and the percent of apples affected and the extent of area involved varied directly, in a general way, with the number of arsenical sprays applied. All the Stayman plots received at least one arsenical spray (including check) and some received as many as five arsenical sprays. This type of injury varied from a mere blackening of the calyx lobes without involving any portion of the pulp to cases involving areas about one-half inch in diameter. The percent of fruit having this type of injury in all degrees varied from five percent to twenty percent. This calyx end injury was not observed on any other variety used in these experiments, yet some of the Grimes and Golden Delicious plots received as many arsenical sprays as some of the Stayman received.

The other type of injury peculiar to Stayman involved varying portions of the fruit adjacent to the stem cup. The injury has been referred to by some investigators as "silvery russet" and by some others, probably incorrectly, as "scarf skin." The affected portion of the apple has a silvery stippled appearance, and when a fruit or a portion of a fruit is severely affected the stipples often "run together."

In general, "silvery russet" was most prevalent on trees that received the most spray applications and had the least color on the fruit. The Stayman check plots that received no sprays after the calyx spray had the least "silvery russet." The best finished fruit from the Stayman plots received four cover sprays of lead arsenate, bordeaux mixture and fish oil soap. The color of fruit from these plots was the best of all the Stayman plots. The factors that made the fruit from these plots the best may have been from several causes and are not considered conclusive at this time.

The fifth type of injury encountered in the 1936 experiments was a dot-type of russet on Grimes and Golden Delicious. This type of russet was produced by all spray materials used, but the degree of russeting varied within wide limits. The wettable sulphur-lead arsenate-casein combination produced less than any other spray combination, and lead-arsenate-bordeaux-fish oil soap was the second best. The coposil and nicotine-bentonite combinations produced more russet, and of greater severity than any of the combinations, with the various calcium arsenate and bordeaux combinations not far behind.

Results obtained by applying the three fungicides, i. e., lime sulphur, Bordeaux mixture and wettable sulphur, during full bloom are not conclusive. Stayman trees sprayed at this time produced fruit which showed little if any injury over and above those which were sprayed according to regular schedule, regardless of material used. The Golden Delicious and Grimes trees which were sprayed during full bloom with lime sulphur or wettable sulphur also produced fruit without additional injury over regularly sprayed trees. Application of Bordeaux mixture to these varieties (Grimes and Golden Delicious) during full bloom, however, resulted in aggravated injury in the form of diffuse and dot-type of russet. There was little indication of increased control of scab by the use of either lime sulphur or wettable sulphur during full bloom. The use of bordeaux mixture at this time gave somewhat increased scab control. The additional injury accompanying this treatment probably offset the benefit of increased control of scab.

Trees which received no fungicide in the calyx application produced fruit which was very badly scabbed, but apparently only slightly injured by spray materials. This indicates that the calyx application was made at a time when the young fruits were quite susceptible to injury by lime sulphur.

Summary

1. Fruits of Grimes and Golden Delicious that were not scalded or scabby, in those plots sprayed with wettable sulphur had the best

finish of all lots of these varieties. Wettable sulphur failed to control scab adequately, and caused serious sulphur burn when temperature was high.

2. The combination of Coposil and nicotine-bentonite caused serious injury on Stayman and Grimes the only varieties that were sprayed with this combination.

3. "Silvery russet" occurred on Stayman only. This type of russet was most prevalent on plots that received the most spray applications without regard to the materials used. There also seemed to be some relation between amount of color on the fruit and "silvery russet."

4. Arsenical burn occurred on the calyx end of the Stayman variety only. All Stayman plots sprayed with arsenicals had some calyx injury. Calcium arsenate with bordeaux caused no more calyx injury than lead arsenate with bordeaux.

5. A dot type russet was prevalent on Grimes and Golden Delicious. The least amount occurred on plots sprayed with wettable sulphur, lead arsenate, and casein. The largest amount occurred on Grimes sprayed with Coposil and nicotine-bentonite. The lead arsenate-bordeaux and calcium arsenate-bordeaux combinations were intermediate.

6. Bordeaux mixture apparently produced injury on Grimes and Golden Delicious varieties when applied at the full bloom stage.

7. Poor scab control was obtained on all the plots in these two orchards.

8. With light initial colding moth infestations excellent control was obtained with both lead arsenate and calcium arsenate. Two nicotine combinations were not so effective.

APPOINTMENT OF COMMITTEES

President Bryan named the following committees:

Auditing: A. L. Towson, William W. Moore, Joseph G. Harrison.
Nominating: G. S. L. Carpenter, W. Lee Allen, E. D. McCain.
Resolutions: Fulton W. Allen, J. A. Caspar, E. C. McFadden.

NEW PACKAGES FOR FRUITS

L. C. CAREY, Marketing Specialist, Bureau of Agricultural Economics, U. S. Department of Agriculture, Washington, D. C.

The total annual movement of fruits and vegetables in this country is well over a million carloads probably more nearly 12 or 13 hundred thousand when shipments by truck are included. In 1934 the total movement was 1,329,176 cars of which 38% moved by truck. It may be interesting to observe that only about 10 per cent of the total moves in bulk. All the rest of this tremendous volume is packed

in some kind of a package. As recently estimated roughly, 4% is packed in barrels, 17% in baskets or hampers, 20% in bags or sacks, and the remaining major portion—49% in crates or boxes. Similar estimates made two years ago were substantially the same. At that time bulk shipments were estimated as comprising 13% of the total —a difference of 3%. This year's estimates indicate that these 3% were absorbed by baskets, bags and boxes in approximately equal amounts.

Naturally these figures are not exact. However, they do serve in a feeble way to show that the habits and practices in the great fruit and vegetable industries are not fixed and constant. It might almost be said that styles in packages for fruits and vegetables like the styles in women's clothes seem ever to be changing, and the quest seems ever to be for a maximum of attractiveness and allure, streamlining and reduced bulk consistent with adequate protection. With some exceptions, the changes we see taking place are really shifts from one type of container to another, rather than the use of actually new containers or new types of containers.

To cite a few instances:

A few years ago the cranberry barrel stood in the door of the grocery store. Today there are no cranberry barrels. Boxes have completely supplanted them.

The fruit and vegetable barrel seems to be going in the same direction, being replaced by the smaller and more convenient basket, and more recently, by the box or crate for apples and the bag for potatoes.

Texas onions are now rarely shipped in the "log-cabin crate." They now go to market in the newly developed, attractive and appealing open mesh bag.

Texas cabbage formerly shipped in bulk is now largely packed in western lettuce crates or half crates and the large, cumbersome, and unwieldy crates formerly used for cabbage in Louisiana and Mississippi have also succumbed to this streamlined container.

And not only cabbage but bunched beets, carrots, turnips and similar products employ this package in preference to the round bushel basket which has been practically abandoned.

A few years ago it was thought that fresh prunes could be shipped from Idaho, Oregon and Washington only in some kind of box like the "suit-case" lug. Today at least half the shipments are in half bushel "tub" baskets.

Everyone can remember when the six-basket crate on any market was sure to contain either Florida tomatoes or Georgia peaches. We still see a few peaches packed in them, but no tomatoes. The so-called Los Angeles lug has entered the Florida tomato deal, and

this is true also in the Mississippi and Texas deals where it has effectively supplanted the distinctive 4-basket crate of that section. For at least half of the Georgia and North Carolina peaches the improved straight sided flat bottom bushel and half bushel baskets are used, but I understand that growers in those states are considering the western type of peach box. This western box ranges from 3½ to 5 inches in depth inside and 11½ inches wide and 18 inches long.

One of the most interesting shifts in recent years is one that is taking place in the west. Baskets have been virtually unused except for berry boxes and small till baskets which require crates when shipped. The west has always been considered crate and box territory. Nevertheless, there are now four or five factories making 1-bushel hampers for the green peas grown out there.

Another shift has reached the citrus fruits, particularly in Florida. Formerly full sized 1⅗ bushel boxes were used exclusively. Today a considerable volume moves in bushel baskets and an even larger portion in bulk. Some sacks are also used, but mostly these are consumer sizes packed after the bulk shipments arrive at destination.

Another package now used for citrus is attracting considerable attention. This package is a two-bushel wire-bound box, extremely light in weight, but apparently strong and sturdy when properly assembled. Its proponents advocate the jumble pack with no particular re-arrangement or facing of the top and absolutely no bulge, the objective being to get away from the loss and damage due to overpacking. As originally designed and used the so-called northeast apple crate employed this principle.

Other instances might be cited:

The competition between one basket or box manufacturer and another is as nothing compared with the competition between the several types of packages resulting sometimes in the utter extinction of one or the other. The Texas onion crate and the cranberry barrel are cases in point.

The bag industry is particularly aggressive. The other day one of its representatives showed me a photograph of West Virginia apples in 5-pound open mesh bags loaded in a car destined for New York City. The car was double decked and each deck padded with a layer of heavy paper over excelsior.

Another photograph showed a car partly loaded with Texas cabbage, another with Colorado green peas, and still another with Texas green corn, all in open mesh bags and completely insulated throughout with power-blown snow-ice. Perfect arrivals at destination are claimed for all these shipments.

It seems that the use of consumer-size bags for certain products

is increasing. For potatoes the 15-pound solid paper bag seems to be preferred in Maine and Minnesota. Idaho uses both 15 and 10-pound bags, usually linen but sometimes open mesh jute or paper.

I am told that 5 and 10-pound open mesh bags are being used in increasing volume for apples, approximately 50 cars being shipped last year from the northwest.

Certain chain stores demand that a major portion of their oranges and onions be packed in 10-pound open mesh bags. The 5 and 8-pound sizes are most common.

Paper Containers.—Paper containers for fruits and vegetables have been offered by that industry in a wide variety of sizes, shapes and types of construction. We are most familiar with paper berry boxes because they come under the Standard Container Act of 1916 the same as any other berry box. Millions of these cups are used in California but they seem not to have attained popularity in any other section, although several plants in the middle west and east report annual productions in varying amounts.

Another type of paper container with which we are more or less familiar is the 8-quart paper market basket which is extensively used in the Northern Ohio, and Western New York and Pennsylvania sections for hot-house tomatoes and also for field-grown and orchard products. Among the talking points for this package are: A perfectly smooth interior having no rough edges to cut the fruit; a perfectly smooth exterior which lends itself to attractive lithographing and advertising; and superior storing qualities of the flat blanks. These advantages appear to outweigh the disadvantage of being subject to damage from moisture whether filled or unfilled and of having to be made up instead of being ready for immediate use as are the wooden woven baskets.

Paper baskets in smaller and larger sizes are also made but not in anything like the same volume as the 8-quart size. These baskets are made chiefly of corrugated paper but solid fibre board is also used. One-half and 1-pound and 1-pint and 1-quart paper cartons are used in large quantities for mushrooms and less extensively for tomatoes. So-called gift cartons for apples are not uncommon but in total volume are as yet commercially unimportant.

There is much more general interest in the progress being made in the use of the larger sizes of cartons for apples and similar products. We would like to know more about this ourselves. It is known that cartons of different sizes have been developed and used for cucumbers sold on count basis, for potatoes sold on weight basis, and apples sold on both count and measure basis. Our feeling is that except in isolated instances this development may still be largely in the experimental stage.

My own observations have been very much restricted, but from them I suspect that for these heavy products and packs, paper containers do not have what it takes to deliver successfully the contents consistently in good condition, at least from the standpoint of appearance. Shipments which travel any appreciable distance whether by train or truck are subject to almost incessant vibration and the tendency is for the contents to settle. The original purpose of packing containers with a bulge pack and closing it under pressure was to compensate for this settling and to insure a relatively full pack when the package was opened. This principle of packing has been terribly abused in actual practice and has been carried to absurd lengths in most cases where wooden packages are used. But be that as it may, it seems that the pressure pack cannot be employed or is not employed when paper containers are used. Moreover the side walls are subject to considerable distention and the natural result—as far as my observations go, is to give to the package the appearance of a slack pack when opened.

This apparent weakness of the paper carton is overcome when the cell-pack principle is employed. This idea is an adaptation of the egg-case and has worked out very well in some localities and for certain varieties of apples. One of the chief draw-backs to this type of package is the necessity for having cells of the proper sizes and shapes to match the several sizes of apples and of having cartons of the proper size and shape to match the cells. This has been partially overcome by using diagonal instead of square cells. By this means one manufacturer claims to provide cell sizes corresponding to the standard pack sizes of apples, all of which fit one carton. I understand that considerable quantities of cell-pack cartons are used for Golden Delicious in the west and for McIntosh in New England and the Hudson River Valley sections.

Northeast Apple Crate.—The one change more than any other that may be of particular interest here is the shift from baskets to crates for apples. This movement started several years ago in the Hudson River Valley and New England. The purpose was to develop a container which would deliver the McIntosh and similar tender varieties of apples in the best possible condition with particular reference to stem punctures and packing bruises. To avoid this kind of injury and resultant decay it was originally intended that the crate would be jumble-packed to within ¾ or 1 inch from the top of the ends and that no appreciable effort would be made to face the package—and, in order to preserve a relationship to the standard bushel basket, the crate was designed to hold *level full to the top of the sides* "a full standard type bulge pack bushel of apples —classed by the trade and Federal authorities as a tight pack."

Our Department has had its little quarrel with the proponents of

the crate on the question of size. The dimensions of the so-called "Approved Eastern Apple Crate" have not been approved by this Department altogether for the reason that the capacity is based on a variable monstrosity—the "heaped bushel" and conforms to no accepted or scientific standard.

The bulge pack is not a requirement of any Federal law. It varies with the product and with the locality and accounts in part for the wide variations in the requirements of the several states with respect to the legal weights per bushel of farm products. These legal weights, it might be said, represent an attempt to compel the delivery of some portion of a bushel more than can be contained in a standard bushel. In our opinion the bulge pack, except in the desirable amount necessary to insure against slack pack, is more or less an attempt to accomplish that purpose and has been carried to extreme and indefensible lengths.

Strangely enough, our objection to the crate could have been and still could be easily overcome without seriously affecting the primary purpose and usefulness of the crate, simply, in the case of the Northeast Crate, by adding 5-16 inch to the depth or a half inch to the length. It would then be of standard 1¼ bushels capacity and could lawfully be marked that way, which, incidentally, probably more nearly indicates the true quantity of apples being delivered than any other of the marks being used on them.

As matters stand we are told that there is little uniformity in the dimensions or sizes of the crates being used in various parts of the east. The growers in western New York adopted a crate of their own—quite different from the Northeast Crate; and Ohio growers in a meeting last summer expressed preference for the western New York Crate. Besides these a number of different crates have been reported. One of these reports this year was to the effect that growers were buying the smallest crate offered and in some instances were demanding crates of not more than one bushel capacity. Another report was to the effect that a crate purchased on the market contained more apples than would fill a 1¼ bushel basket.

Thus we have confusion—real or fancied or both—with nothing really definite to tie to. This is not intended as disparagement of the crate, but simply of the chaotic conditions attending its use. The package has proven its worth, judging from all reports, not only for the tenderer sorts of apples but for most of the better sorts as well. Even though in some instances the practice has changed from a simple jumble pack to a faced pack or even a layered pack with card-board dividers, the crate retains most of its original advantages, among which are less injury from packing, and better loading and storing qualities. No doubt it will continue to have a wide and in-

creasing popularity which, in my opinion, could only be enhanced by bringing it to a uniform and universal standard.

The comments of Mr. F. A. Motz, Department representative in London, may be of interest. Concerning packages for export he stated in part as follows: "Prices received for basket fruit have compared very favorably with barrels, three baskets bringing as much, if not slightly more than one barrel. Gross values, however, in this instance are very misleading since the cost of transporting and handling three baskets is much higher in proportion. By comparing account sales of a car of barrels with a carload of baskets one arrives at the best answer to this question. Freight, handling charges, etc., on a barrel are approximately two-thirds of the costs involved in handling three baskets. Unless baskets can command a substantial premium over the barrel, the barrel is the more economical package to use. After the barrel, the basket is the more economical package to use. After all, shippers are interested in net returns, rather than gross sales."

"It is difficult to measure the success of the basket owing to the irregularity of supply. Shipments have been very spasmodic and no attempt has been made to develop a regular trade.

"In some respects the box-crate compares with the Australian dump-case except that the sides do not come flush with the ends of the box and the cover is slatted. Cardboard liners would improve this package and prevent a certain amount of bruising and cutting which is usually noticeable. It would also prevent small sized fruit from falling out.

"The face and fill or jumble pack is accepted about on the same basis as some of the less desirable packs from Australia. If this package is to be popularized, it must be put up in a style somewhat similar to that of other countries. When the pack fails to come up to top, the slack is taken up by using wood wool or a heavy pad. Eastern growers are able to land a fairly tight package by the face and fill method. Racking the boxes several times during the process of filling and by using a flexible top and bottom which will give under pressure, should ensure a fairly tight package upon arrival. The box-crate is easier to stow, stack and handle than the basket.

"It is my personal opinion that it will be many years before the barrel becomes obsolete as an export package."

LIMING AND FERTILIZING COVER CROPS AND SOD IN MARYLAND ORCHARDS

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State agricultural experiment stations have been studying for years to determine the best methods of orchard management and of orchard fertilization. The best results secured have not even yet become standardized for all conditions of climate, soil and other localized conditions.

In Maryland, the following methods and treatments are being used by the Soil Conservation Service, cooperating with the University of Maryland Agricultural College and Experiment Station. Both vegetative and mechanical methods of control of soil erosion are being used at Boonsboro, and it is thought that a summary of the work being done may prove of interest to Maryland orchardists and to others similarly situated.

We shall consider the subject in relation to apple and peach orchards. It may be said that the liming and fertilizing of cover crops applies mainly to peach orchards and those apple orchards which are cultivated. Liming and fertilizing of sods refers directly to apple orchards.

In order to have a full understanding of this subject it is necessary to know what cover crops are and the kinds commonly grown in orchards. Cover crops are those which are sown or planted in thick stands for the purpose of protecting and enriching the soil and may be classed as leguminous and non-leguminous. Leguminous cover crops commonly used are red clover, lespedeza, crimson clover, vetch and soybeans, while non-leguminous cover crops consist of rye, barley, oats, millet and Sudan grass. A combination of rye and vetch makes a very desirable cover crop.

Value of Cover Crops.—Before discussing liming and fertilizing of cover crops, their value to orchards should be pointed out, which, briefly summarized, is as follows:

1. Improve the physical condition of the soil. 2. Reduce the tendency of some soils to bake or puddle. 3. Protect the soil from washing, thereby controlling erosion. 4. Allow for greater penetration of water by making the soils more absorptive. 5. Aid in drying out the soils in spring for early spraying and tillage. 6. Increase vegetation, which slows up the run-off of water and allows more of it to penetrate into the soil for plant use. (Adds organic matter.) 7. Catch and hold some of the leaching nitrates, especially during August and early fall when they are indispensable to the crop.

Water Retention by Mechanical Methods.—It is generally known

that the supply of capillary water in the soil is sometimes a limiting factor to growth and leaf color obtained in apple orchards. Mechanical methods may be used to retain water in addition to those gained by cover crops and other vegetation. The use of level or gradient terraces or contour furrows will slow up the run-off of water and hold it to penetrate into the soil.

In the vicinity of Hagerstown, Maryland, following a protracted drought when the soil was apparently thoroughly dried out to a depth of more than three feet, approximately one-half inch of rain fell over a period of four days. The penetration was then determined as follows:

A field of Frankstown soil on a 25 percent slope that had been contour furrowed with the furrows 25 feet apart showed the following water penetration:

Midway between the furrows—14 inches

Four feet above the furrow—10 inches

Four feet below the furrow—24 inches

A terrace system with the terraces approximately 70 feet apart on Dekalb soil on a 14 percent slope showed the following penetration of water:

Midway between terraces—20-26 inches

Ten feet below terrace, at least 3 feet

Above upper terrace, not to exceed 10 inches.

A system of terraces in an apple orchard, part of which has been in operation 25 years and part 16 years, was observed last month. The owner stated that the trees planted on terraces constructed on the contour have grown more rapidly and produced more profitably than those planted on unterraced land. He attributes these facts to the larger moisture supply available to the trees planted on terraces.

Cover Crops and Terraces.—Cover crops in clean tilled orchards add to the efficiency of the terraces by reducing the rapidity of flow into the terrace system thereby allowing greater penetration. Cover crops when plowed under, improve the physical condition of both heavy and light soils and increase the water holding capacity and the infiltration of water into the soil.

By holding the water in the orchard, run-off is prevented and the amount of water available for the trees is increased.

This gives an idea of the value of both vegetative and mechanical methods of holding water and indicates the depth of penetration that results from putting these methods into practice.

Cover Crops Essential.—Tillage hastens the destruction of soil organic matter. In so doing it furnishes increased amounts of nitrates for the trees. Most fruit growing soils are low in organic matter,

which makes it necessary to use some means of replenishing the fertility and organic content. Cover crops should be grown and turned under as green manure to replenish the supply of organic matter.

Cover crops in clean tilled orchards should be a part of efficient soil management just as spraying is essential to secure a good quality crop.

It is a good practice to seed the cover crops at the time of the last cultivation, which should be fairly early in the summer. The cover crop draws on the moisture and nitrate supply of the soil, reducing the amount available for the trees when a reduction is desirable to insure proper ripening and coloring of the fruit.

The cover crop should be plowed under in the spring while still green. If plowed under early, the organic matter decomposes rapidly, thus furnishing nitrates for the trees when they need it most.

Liming the Cover Crop.—Liming is of little direct benefit to fruit trees. Orchards should be limed only when it is needed for cover crops. Orchard soils are frequently acid in character, and lime is essential for the legumes. The application of lime might increase nitrate formation by hastening the decomposition of organic matter and by increasing the activity of the independent nitrogen gathering bacteria of the soil.

On the other hand, over-liming is not a good practice and should be avoided because of the possibility of reverting the phosphorus to a tri-calcium phosphate, thus making it unavailable in sufficient quantities for leguminous cover crops.

In Maryland the orchards are usually on fairly steep lands which are low in organic matter due in a large part to erosion. Results of tests of these soils usually show that in most orchards nitrogen is the limiting element. For the cover crop phosphorus and potassium are also needed.

Fertilizing the Cover Crop.—In the tilled orchard, the fertilizer requirements should be determined largely on the cover crop. Cash crops grown in young orchards should be fertilized the same as under field conditions. The treatment supplies any additional plant food needs of the young trees that are not entirely satisfied by the soil itself.

Fertilizing the cover crop results in more luxuriant growth and by increasing the fertility of the soil reduces competition for nitrogen.

Fertilizing the cover crop indirectly affects the fruit in the following ways: 1. Increases the number of strong blossoms and buds which will develop into fruit. 2. Insures satisfactory size of fruit. This is accomplished by more humus in the soil and greater water-

holding capacity. 3. Promotes annual bearing. 4. Gives more uniform tree growth.

Usually, over-fertilizing the cover crop does not result in injury to the tree or fruit. However, if the tree is over-fertilized it may result in: 1. Too late growth. 2. Blight in apple and pear trees. 3. Delayed maturity of peaches. 4. Poorly colored fruit.

Sod in Orchards.—An orchard may be considered to be in sod if it is not tilled, but seeded to sod-forming plants for a period of years. To obtain the sod it is desirable to use legumes such as alfalfa, sweet clover, or lespedeza with a mixture of Kentucky bluegrass, timothy, red top and other long life perennial grasses.

Lespedeza is growing in favor among Maryland orchardists. It is seeded in the spring and allowed to reseed itself in the fall. It is a good practice to go over the ground with some implement which will help shell out the seed. This will give more plants the following spring.

If a sod-bound condition should exist in an orchard having a cover of perennial grasses, it is important to correct such a condition by using a disk, spring tooth harrow or similar implement.

When orchards are left in sod, two crops are produced at the same time and, of course, additional plant food is required. The grass competes with the trees for the soil's supply of nitrogen, which is insufficient for both crops, especially in the early spring. The grasses also have a depressing effect on nitrate formation, thereby making the supply of available nitrogen low in the sod orchard. Unless the soil nitrogen supply is increased the foliage will become yellowish green in color, growth will be retarded and bud formation reduced; the set of fruit will be lessened and the "drop" increased. For successful production, the addition of nitrogen in the form of commercial fertilizer or farm manure is essential. If legumes are used for cover the need of additional nitrogen is greatly reduced.

When the orchard is to be kept in sod, provisions should be made for its maintenance. If the soil is acid, lime should be applied to correct the acidity. In addition, the use of a phosphate fertilizer every two or three years will invariably bring in alsike and white clover and increase the stand of bluegrass. Where there is sufficient farm manure the whole orchard should be treated. Eight to ten tons of manure can be applied per acre, which will benefit the fruit, and the increase in the growth of grasses and clover will result in a larger hay crop or additional material to be left as a sod mulch.

For most economical results it is best to apply nitrates directly to the tree in the early spring.

It is evident from this brief summary that there are many factors which affect the successful production of fruit and cover crops.

ADJUSTING THE SPRAY PROGRAM AND MATERIALS TO CONTROL THE CODLING MOTH

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Once more many fruit growers in the Shenandoah-Cumberland fruit area have been surprised at what the codling moth could do after July 1. In many instances the usual May-June sprays were applied and the fruit appeared clean. But after the spray machine had been stored in the shed or left to rust under a tree and the trials and tribulations of the spraying season had been laid aside, a distressing outbreak of "side-worms" began in late July and continued into September. Where did they come from? What can we do to stop this late worm injury?

I shall answer the first question by giving you an example from our experience of 1934. Through May and June of that year we sprayed an 8-acre block of Yorks in an attempt to eradicate the first brood without the use of lead arsenate. The sprays were applied at weekly intervals and the last application was on June 28. During the first week in July a very careful examination of the fruit taken from all parts of quite a number of trees in the block showed that about 3% of the fruit contained very small but live larvae, and that the total amount of fruit showing visible codling moth injuries (stings and live worms) was only 5%. One gained the impression on walking through the orchard that the fruit was clean and free from any important codling moth injury. No sprays of any kind were applied after June 28, so that the second brood was allowed to develop as it might from the few individuals of the first brood which survived the May-June sprays. In early October 25.3% of the apples on the trees were wormy and 5.5% were "stung." In other words, 30.8% of the picked fruit showed visible codling moth injuries when examined in October. This experience merely emphasized how important a few survivors of the first brood may become when no second-brood sprays are applied in July or later.

In orchards where sprays are generously applied we have learned from experience that apples must be washed on account of the lead residue, if sprayed later than about June 10. We also know that calcium arsenate applied in early July in heavily sprayed orchards will necessitate washing the fruit on account of the arsenic residue. Furthermore, when calcium arsenate is substituted for lead arsenate in late June it usually fails to control the late first-brood larvae, and after that let-down in the program against the first-brood we can expect most anything to happen when the second-brood gets to work in late July. I shall dismiss further mention of substitute materials for lead arsenate by saying that no practical substitutes are

available for orchards where the codling moth problem really is present.

Growers who cannot wash their fruit will have to continue to omit spraying for the second brood in July, and under our conditions in Virginia, they must leave lead arsenate out of the late June spray against the first brood. In isolated orchards where the codling moth infestation is never very heavy, such a program may be practical. In most of the orchard region, however, such an adjustment of the spray program to avoid washing usually results in a victory for the codling moth before the apples are picked in September and October.

In order to obtain better control of the codling moth it is necessary to seek ways and means of increasing the efficiency of lead-arsenate. I shall mention three with which we have had experience.

Summer oil.—Considerable improvement in control results from the addition of refined petroleum oil to two cover sprays of lead arsenate in June. The oil kills codling moth eggs as well as serving as a sticker for the lead arsenate. If lead arsenate is used alone, 3 quarts of an 83% oil emulsion is sufficient, but if Bordeaux mixture is added, 4 quarts of the emulsion will be required to give equivalent ovicidal effect. We do not recommend the use of oil in July because of the increased difficulty usually encountered in residue removal. The use of summer oil against the first brood is practical and effective wherever the sprays are thoroughly and timely applied.

Soap (soluble fish oil).—For the past two seasons liquid potash fish oil soap (1 pint per 100 gallons) has been used experimentally as well as by a number of growers in cover sprays wherever lime or Bordeaux mixture was used with lead arsenate. Soap in such combinations has, according to our experience, increased the effectiveness of the lead arsenate against the codling moth. The fish oil soap used for this purpose contains from 25% to 30% soap and should contain no free fatty acid or free alkali. The following have been used quite extensively, the materials being added to the tank in the order named: potash fish oil soap 1 pint, lime 1 pound and lead arsenate 3 pounds per 100 gallons; or if Bordeaux mixture is used, make the Bordeaux mixture in the tank as usual, then add the fish oil soap and finally the lead arsenate. According to laboratory tests, toxicity of the above combinations is reduced if the lead arsenate is added first and then the soap next. In other words, the lime or Bordeaux mixture and the soap should be allowed to react rather than the soap and the lead arsenate. If lead arsenate is added to the tank first the lime or Bordeaux mixture should be added next and finally the soap. Increasing the amount of soap above 1 pint per 100 gallons reduces efficiency by causing excessive run-off.

Nicotine, oil, and lead arsenate.—This is a triple-acting spray and is the most effective that I have yet used against the codling moth. I shall mention its use very briefly because the high cost of materials

will prevent general use of the combination. The nicotine is included to kill moths, the oil to kill eggs and the lead arsenate to poison the larvae. For the past two seasons we have used such a triple-acting combination in an attempt to eradicate the first brood in May and June and omitted spraying for the second brood in July and August. From six to eight acres were sprayed in each orchard and the remainder of the orchard was sprayed by the grower. The schedules used and the results obtained are given in Table 1.

TABLE 1.—Results obtained from spray schedules intended to eradicate the spring brood of codling moths and the first brood of eggs and larvae in May and June, compared to results obtained by the grower in the remainder of the orchard.

Year and orchard	Spray schedule and date last spray was completed	Codling moth injury		Fruit examined	Lead residue gr./lb.
		Wormy %	Total injuries %		
1935 Ben Davis orchard	A* July 1	1.8	5.6	Drops and tree fruits	.058
	Three covers of lead arsenate ending June 29	27.1	60.5	Tree fruits only	.048
1936 Ben Davis orchard	B** June 20	8.6	23.3	Drops and tree fruits	.056
	Two cover sprays of lead arsenate ending July 7	67.4	75.3	Tree fruits only	
1936 York orchard	B** June 19	6.5	26.5	Drops and tree fruits	.050
	Check, no cover sprays	76.7	82.3	Drops and tree fruits	
	Five covers of lead arsenate ending Aug. 3. Orthol-K oil 3 qts.—100 gal. in last two covers	1.0	21.0	Tree fruits only	.184

A* SCHEDULE.—Materials per 100 gallons were lead arsenate 3 pounds plus nicotine sulphate 1 pint in the first cover, followed by lead arsenate 3 pounds plus Orthol-K oil emulsion 4 quarts and nicotine sulphate 1 pint in the second cover and also in the third cover, except that nicotine bentonite 6 pounds was substituted for the nicotine sulphate in the third cover. Hydrated lime 2.3 pounds in the second cover and Bordeaux mixture (2-4-100) in the third cover dated June 20, 1935. On July 1 a fourth cover consisting of Orthol-K oil emulsion 3 quarts and nicotine bentonite 6 pounds was applied.

B** SCHEDULE.—Materials per 100 gallons were lead arsenate 3 pounds, Ortho-K oil emulsion 4 quarts and nicotine sulphate 1 pint in three covers. Lime 3 pounds was added in the first two covers.

THE COLOR FACTOR IN FRUITS

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Lack of color of apples in the eastern United States is one of the most serious problems confronting the industry. Much work has been done to solve the problem but it far from satisfactory as yet. If an apple is green like Rhode Island Greening, the market wants it green and not blushed or bronzed. If the characteristic color is yellow as Grimes Golden or Golden Delicious, the market wants it a good rich yellow and not greenish; or if it is a red variety such as Jonathan or Baldwin, the market demands a good red color, so it becomes a matter of real economic importance.

What Is Color?

You may ask the question, What does color consist of and from what is it derived and under what conditions does it develop? We are familiar with many colors in nature, green being the most conspicuous one. We find that these colors are derived principally either from color plastids in the cells or soluble color material in the cells. Orange, yellow, and green colors are largely due to plastid pigments, and blue, purple, violet and nearly all reds to soluble pigments known as anthocyanin.

These antrocyanin pigments which account for the red color of apples are derived from sugars, more particularly from glucosides. If high color is to be developed it means that there must be a sufficient excess of carbohydrates (starches and sugars) produced in the plant to allow these glucosides to develop. If the carbohydrates combine with the nitrates in excessive amounts in the plant to form proteins we could expect poor color conditions in the fruit, or if photosynthesis is diminished or foliage is destroyed by disease or insects we would expect lack of sugars which would react in the fruit color.

Experimental Evidence

It has been shown experimentally that red color in apples, pears, and peaches requires the presence of sunlight on the fruit for the color does not increase in storage. On the other hand the color in strawberries, cherries, blackberries and grapes will develop without the presence of sunlight. Not only is sunlight necessary, but the ultra violet rays aid materially in fruit coloring. Magness has shown that if the ultra violet rays are screened out of the light, very little red color develops. He has also shown that there is a

correlation between the number of leaves per apple and the amount of red color developed. For instance where 10 leaves per apple were left on the tree there was 23% of solid red color on Delicious apples at Wenatchee, Washington; while 75 leaves per apple resulted in 58% solid red color.

Thinning, which is a phase of the above, is also a means of increasing the amount of red color in fruit. At the Experiment Station at Wooster, Ohio, unthinned Jonathan trees carrying a thousand pounds of fruit produced 61.55% U. S. Fancy, while those thinned to 14 inches apart and having 623 apples to the tree had 87.27% U. S. Fancy. A tree thinned to 10 inches apart and carrying only 394 apples produced 93.58% U. S. Fancy on a color basis.

Color Conditions

The orchardists would naturally be interested in any material which could be applied to the soil to increase the color of fruit. So far as I know nothing of this sort is available. However, the red color can be materially reduced if excessive amounts of nitrogen are applied or excessive tillage is carried on. It is possible that the orchardists will have to make a compromise between the maximum growth and yield and the amount of color desired. It is quite possible that in some sections too much nitrogen has been added. However, up to the present time in our own experiments we have not been able to increase the color by the application of phosphorus or potash, or both to the soil. Of course if these materials are added and no nitrogen is used the color will be enhanced, but this is because of lack of growth and not because of the other elements which were used. For instance, Nightingale of New Jersey showed that Elberta peach trees which were low in carbohydrates and high in nitrogen produced fruit that was green in color and late ripening, while trees which were high in carbohydrates and low in nitrogen produced fruit that was soft ripe on August 31st and it was of a golden yellow color and almost completely overlaid with a deep red blush.

We have found under Ohio conditions that we get a somewhat better finish which enhances the color whenever mild sprays are used while caustic sprays may give a fine russet of the fruit which produces a dull color.

Varieties

One of the greatest factors in color production is the selection of the proper varieties and good soil types. The greatest advancement that has been made along this line is the introduction of red sports of the standard varieties. For instance red sports of the Delicious, Jonathan, Gravenstein, Twenty Ounce, Stayman, Rambo, York and

many others has given the market new varieties and almost of a guaranteed red color in comparison with the old strains. Whether or not these red sports will all be superior to the parent varieties in other respects is yet to be determined.

CULTURE AND HANDLING OF RASPBERRIES AND BLACKBERRIES

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The comments I will make on the subject of raspberries and blackberries are necessarily based largely on observations made in New Jersey. Some of them may not apply directly to your problems but I shall stay as closely as possible to fundamental facts which apply anywhere, and make just a few practical applications, insofar as my rather limited knowledge of your local conditions will permit.

Berry growers, like other farmers, are often inclined to blame unsatisfactory plant growth, low yields and low returns on some one factor such as diseases, insects, winter injury or lack of rainfall. This factor may be the most important at the time but usually there are several other things affecting the crop which may be overlooked. Expressed another way, berry growers should endeavor to see that all factors are favorable insofar as it is economically feasible.

In order to do this, they should take stock occasionally and see whether they are giving attention to all details which should be considered in their cultural program. Furthermore, it is rather essential that they have some kind of a definite program to be used as a guide in their attempts to improve yield and quality of fruit. I will suggest such a program including seven distinct points. The slighting of any one of these points may result in decreased yields or poorer quality or both.

This program in general can be applied to either blackberries or raspberries. Since the red raspberry is the most important of the brambles, I will base my remarks largely on that fruit. Many of the things I say will apply to black caps and blackberries, as well, but if they apply only to those fruits, I will so state.

I would like to stress the following seven points as the basis of a raspberry and blackberry program:

1. Plant on suitable land.
2. Plant the best varieties.
3. Plant vigorous nursery stock that is free from pests.
4. Maintain fertility and soil moisture at a satisfactory level.
5. Prune according to the needs of the individual plants.

6. Control pests.
7. Harvest carefully and pack honestly.

I will discuss a little more in detail each of the seven major points in the program.

Plant on Suitable Land.—A well drained, fertile loam or sandy loam, rather retentive of moisture, is desirable for raspberries and blackberries. Varieties differ in their response to soils that are too dry or too moist. Bush blackberries, in particular, are likely to be adversely affected by being grown on soil that is too dry. I am not familiar enough with the soil types in this locality to discuss in detail the adaptation of berries to the different types. Texture, fertility and moisture holding capacity, however, are of prime importance. Too often growers locate a berry patch in some place that is convenient or that is not being used for some other crop rather than because it is particularly adapted to berries. Berries should be grown intensively and, in view of the expense of production and the size of the possible returns, it is quite evident that every effort should be made to locate the planting on a favorable site.

Another feature which should be considered in this connection is the matter of crown gall. Soil that is known to be infested with crown gall from some previous crop should certainly not be planted to raspberries until some time has passed.

Plant the Best Varieties.—It is sometimes easier to say, "Plant the best varieties", than it is to specify what those varieties are. That can be finally determined only by testing out a few of the best ones under local conditions. I would like to mention a few varieties and some of their characteristics as observed in New Jersey.

The Latham raspberry is, of course, the leading commercial variety in most of New Jersey, as it is in most parts of the United States. We are still recommending it as the best commercial red raspberry variety.

The Ranere (St. Regis) variety is of New Jersey origin and is grown extensively in one area in south central New Jersey. For many years it was the leading variety in the state but is now giving way to Latham and others. Ranere is especially adapted to very light sandy soil and has been profitable in only a very few localities outside of New Jersey. I would not recommend it for planting here except possibly for the home garden where a fall crop is desired.

The Chief is a comparatively new variety which has proven of commercial value in certain limited areas. It is not as universally successful as Latham but is worthy of trial if you are interested in an early ripening variety.

The Viking is a high quality red variety from Canada. At New

Brunswick it has been one of the best varieties and has consistently outyielded Latham. Unfortunately it has not been as successful in other parts of the state so that we have not recommended it except for trial on a very small scale.

The Newburgh is another new variety coming from the New York Experiment Station which has looked especially good in a few limited localities. Its berry is firmer and it is probably easier to handle after picking than any other variety. Unfortunately it is of doubtful productiveness under our conditions and cannot be recommended for general planting.

The Taylor, also coming from the New York Experiment Station, is a new variety, which was sent out a year ago for the first time. It appears to have real promise and will probably become one of our standard varieties.

The newest of the named varieties is Marcy, another New York variety, which was named only last fall. It is an extremely vigorous, large fruited, productive variety. At New Brunswick, N. J., it has seemed to be superior to Taylor and unless something develops to interfere with its progress, it should become one of the most important of the commercial varieties.

Practically no black raspberries are grown in New Jersey and so our tests of new varieties have been much less extensive than they have with the red raspberry. We have not been able to grow the Cumberland or Plum Farmer with any degree of satisfaction principally because of trouble with mosaic disease which came in on practically every lot of plants secured. Two of the newer varieties have been outstanding in our variety plots. The first of these is Quillen, a variety from the middle west, which has exhibited some degree of resistance to anthracnose. The other variety, and the one which for the last two years has been superior to all other black cap varieties in our tests is the Bristol. This is a very vigorous, productive, large fruited sort from the New York Experiment Station. Unfortunately it is somewhat subject to mosaic and we have had to rogue our planting very thoroughly. If this variety can be maintained free from disease, it appears to me to be very promising indeed. Two other varieties from New York, Dundee and Naples, have not been as satisfactory with us as the Bristol.

The blackberry variety situation is rather unfortunate due to the lack of really good varieties and the fact that the ones available are rather badly mixed in some of the nurseries. These mixtures may have come about originally in nurseries where several varieties were being grown in a small area with rows close enough together so that suckers could come up in adjacent rows. I shall not comment on all the old standard varieties, some of which are still good, but only on certain ones of special interest.

Blowers is an old variety which has done well in our variety tests at New Brunswick, N. J. In our tests it has seemed rather better than Mersereau, Erie, Ward, Eldorado, etc.

The rather highly advertised new Alfred has been fairly good but not outstanding in our tests.

The most important bush blackberry variety in New Jersey, from the standpoint of acreage, is the Russell, sometimes listed as Best-of-all. The Russell has proven to be particularly adapted to very light sandy soils and so I would not recommend it to you for moist, fertile soils.

The trailing blackberry, commonly known as Oregon Evergreen or Black Diamond, is grown rather extensively in one New Jersey region. The past three cold winters have resulted in serious injury to this type but a thornless sport from the Pacific coast has proven to be somewhat more hardy than the thorny varieties and in addition is much more economical, as well as more agreeable to handle.

All of the red raspberry varieties I mentioned, except Ranere, have resulted from definite plant breeding projects. Similar work is needed in the case of blackberries and until such time as this work is done, we shall probably not have really good varieties. Some of this breeding work has been started on a small scale and the better varieties will undoubtedly come in the future.

Plant Vigorous Nursery Stock that is Free from Pests.—The importance of using only vigorous plants of any horticultural crop is well known. Small, weak plants if free from pests may make satisfactory growth if growing conditions are ideal, but ideal conditions can not be counted on. When dry weather, excessive rainfall, lack of sufficient nitrogen, or other unfavorable conditions prevail, the more vigorous plants will get a better start and will maintain their superiority for the first year or even longer.

With raspberry plants, both red and black, however, there is an even more important factor involved in the quality of the nursery stock than mere vigor of plant, and that is freedom from mosaic diseases. The grower who uses his own plants has to assume the responsibility of selecting mosaic-free stock. This is not the place to go into detail as to symptoms but I would like to emphasize the great importance of being able to recognize them if you are going to grow your own plants. A mosaic infected plant is not only worthless but a liability, as it will be a center of infection from which the remainder of the planting may acquire the disease. If you purchase plants, by all means get them from the best possible source even if the price seems a little high. Nurseries in states having very rigid nursery inspection should be preferred.

Crown gall is another plant-borne disease which should be con-

sidered in plant selection. In one area in New Jersey it is the custom to set green shoots of the red raspberry in May rather than the hard, dormant plants. There is some evidence that such green plants carry a smaller percentage of crown gall infection than do the dormant plants.

It is sometimes recommended that nursery plants be dipped in lime sulfur if anthracnose spots are present. They are not likely to be present on good red raspberry stock and I would prefer to cut off all the old cane when planting black raspberry tips. Such tips should be practically dormant when transplanted.

Maintain Fertility and Soil Moisture.—The raspberry requires a liberal supply of organic matter in the soil for satisfactory growth. This may be maintained by adding manure, mulching, or growing cover crops. On very light or dry soils, the use of a mulch will be of great value in maintaining moisture during dry weather. In some preliminary tests in New Jersey the yields of red raspberries were greatly increased by the use of mulch. These tests were conducted on a rather dry, gravelly loam. During dry periods there was as much as 55% more water in the soil under the mulch. The effect of the mulch on soil temperature is significant also when we consider that the raspberry is naturally adapted to rather moist, cool soils. In some of the tests the temperature of the soil 3 inches below the surface was as much as 20 degrees higher where the soil was not mulched than it was where the mulch was present. These readings were made during the hottest part of the day.

In these experiments, salt hay was used as a mulch at the rate of 6 tons per acre. Each year some additional material was applied to areas where the mulch was getting thin, about 2 to 3 tons per acre being sufficient to bring the total up to a satisfactory amount.

It was found that the fertilizer program was affected by the use of mulch as some additional nitrogen had to be used on mulched plots the first year. The reason for this was that certain soil micro-organisms which cause the dry mulch to decay tie up, in their own bodies, a great deal of the available nitrogen, thus taking it away from the plant until such time as the micro-organisms die and themselves decay and release the nitrogen for use by the plants. Plots that were mulched but not given any more nitrogen than the cultivated plots contained plants that were distinctly yellow and obviously lacking in nitrogen. The addition of 200 lbs. of nitrate of soda per acre to the regular fertilizer application caused mulched plants to be vigorous and green. Some of our New Jersey growers have had the same experience on fairly large acreages grown under mulch.

Some of the New Jersey growers were reluctant to try mulching because they were afraid the shoots would not come through. Actually the shoot growth has been extremely good, so good in fact

that the pulling or cutting off of the shoots is something of a task. Another objection has been the fire hazard. This is a real danger although so far we have had no instances of actual damage. Certainly fire lanes at regular intervals should be kept under clean cultivation.

We are not recommending that all raspberries in New Jersey be grown under mulch but we do believe that mulching will become a much more common practice than it is now. It will be of special value on very dry soils, where cultivation is difficult for various reasons, where fancy fruit is desired for a special market, or in the home garden where the cultivation of a berry patch is always a problem.

The fertilizer program should be designed to produce a strong, vigorous cane growth. The crop you get this coming spring will depend much more on the type of canes you have now as a result of last summer's treatment than it will on any fertilizer applications you can make this spring. Much of the cane growth is made during late summer and so it is essential that conditions be favorable at that time. In New Jersey it is sometimes necessary to apply fertilizer, especially nitrogen, during the summer. We have not found that such applications increased winter injury but rather that the weaker, slower growing canes have usually been injured most.

The actual fertilizer requirements of raspberries or blackberries on a given soil can, of course, be determined only by a study of that particular soil. I will not attempt to make any recommendations, therefore, because I am not familiar enough with your conditions. I would simply suggest that for satisfactory growth there must be in the soil sufficient quantities of available nitrogen, phosphorus, potassium, calcium, magnesium and the minor elements.

Prune According to the Amount of Growth.—Bramble plants can adjust themselves somewhat to over- or under-pruning. If a cane is pruned severely, it will have fewer but larger fruits than if it is pruned too lightly. The size of the individual cane should be considered when pruning and the smaller canes cut shorter than the large ones. Some of our growers prune with hedge shears, which is all right where the canes are uniform. The actual length of cane to leave at pruning time is something that you will have to determine for your particular variety for your particular soil and fertilizer program.

Control Pests.—I have already spoken of the necessity of securing mosaic-free plants for establishing a planting. In spite of all you can do some mosaic will probably appear and so the planting should be rogued very thoroughly the first year. Later rogueing will depend on the amount of disease and whether you want to dig plants.

In New Jersey we find we have to spray red raspberries, especially Latham, for anthracnose. At the present time our growers spray their raspberries as a matter of course, as they spray their tree fruits. Our spray schedule involves two sprays.

1. Lime-sulfur, 1-20, at the delayed dormant season.
2. Bordeaux, 3-6-50, just before the blossoms open. Where a special effort is being made to clean up disease, two additional Bordeaux sprays are applied, one when the largest berries are about half grown and the other immediately after picking. The two later sprays have been of special value in control of septoria leaf spot in some years. This disease has caused serious damage on unsprayed plantings in one of our New Jersey berry sections.

The removal of old canes immediately after picking is an adjunct to spraying in the control of anthracnose but is not sufficient in itself to give control. The spraying program outlined is *not recommended in New Jersey for black caps* as some spraying tests have indicated that injury may be caused by summer applications of Bordeaux. We are recommending the delayed dormant spray alone except for certain cases where a disease clean up is especially desired and where some spray injury can be tolerated for the sake of disease control.

Other diseases as well as insect pests, if present, should be considered in this part of the berry program. This would include Japanese beetle, green worms, various species of borers, etc.

Harvest Carefully and Pack Honestly.—Probably I do not need to stress this point in the program but in many producing sections it is one of the points which needs constant attention. In New Jersey, it has been a difficult problem because of the difficulty of securing an adequate supply of good pickers.

Our growers find that it is necessary to pick Latham every day if the fruit is to arrive on the market with a good bright color. Pickers frequently place over-ripe berries in the cups but face up with bright fruit. That is natural, as they want to get as many quarts as possible, so it is the grower's responsibility to see that the pickers discard over-ripe or blemished berries.

Some of our growers have had some success with facing or plating the individual pint cups. This involves arranging the berries in rows with the receptacle cavities placed downward, out of sight. One of our growers so faced the crop from several acres for two or three years. Last year this grower found he got about the same premium by covering the cups with cellophane and that it was cheaper than facing. Naturally it will pay to use such expensive methods only on fancy fruit designed for a market which will pay a premium for something a little out of the ordinary.

I hope some of the details I have mentioned may be helpful to you but the principal thing is the standard of practice for the program as a whole. If I cause you to check upon each point as it applies to your own business and then consider it as a part of a definite, complete program, my purpose will have been accomplished.

RASPBERRY DISEASE CONTROL

GEORGE L. ZUNDEL, Assistant Professor, Plant Pathology Extension, Pennsylvania State College, State College, Pennsylvania.

One of the important factors that limit the economic production of raspberries is the presence of several very destructive diseases. These diseases in many ways shorten the productive life of the plants and materially increase the cost of production. It is, therefore, an actual saving to control diseases.

We will consider three general types of raspberry diseases.

1. *Bacterial* diseases are caused by the lowest forms of plant life. In order to obtain food, bacteria attack various forms of dead or living organic materials. One species of bacteria uses the raspberry plant as its source of food and causes *crown gall.*
2. *Fungi* are also low forms of plant life but more highly organized than the bacteria. They, too, depend upon dead or living organic material for their food. Several fungi use the raspberry plant as their source of food. The fungus that causes anthracnose is one of the most destructive fungi attacking raspberries.
3. Within the last generation a third type of disease has been recognized and studied. This is the group of diseases caused by various kinds of viruses which are perhaps chemical substances within the sap and tissues of plants. Several viruses attack raspberry plants and cause such diseases as the mosaics, the leaf curls, and the streaks.

Crown gall is the most destructive bacterial disease of brambles. The disease is not confined to brambles but attacks a large number of plants including fruit trees, grapes, and it has been known to attack such plants as tomatoes, beets, etc.

The disease develops as galls of various sizes on the roots or at the crown of the plant and may cause damage by (1) a splitting of the bark, followed by the drying out of the roots; (2) production of seedy berries; (3) weakening of the canes so that they are easily broken by wind or other agencies; (4) partial or complete suppression of new canes; (5) dwarfing of the plant; (6) interference with the normal functions of the plant especially in hindering water movement and transportation of food; (7) death of the plant.

Countless numbers of bacteria are produced from a single gall and under suitable moisture conditions are given off continuously into the surrounding soil. Once in the soil, the bacteria can live there for over a year and be able to produce infection. It is not possible for the bacteria to infect a plant except through a wound. Mechanical injuries and soil inhabiting animals are the most frequent causes of wounds.

Cane gall is usually confined to the black raspberry and blackberry. For our purpose, it will be considered as a separate disease or at least a special form of crown gall. The galls develop along the stems and as they enlarge cause the bark to split allowing the cane to dry out. Infected canes are weak and they die or are broken by the wind. Cane gall tumors are often found on the smallest terminal branches.

Control: Crown gall and cane gall are controlled by the use of disease-free plants, from disease-free fields and planted in disease-free soil. This fact is most important since it is now known that crown gall is carried from the nursery as new undeveloped infections that cannot be detected by inspection.

Anthracnose is the most important of the destructive raspberry fungous diseases. It causes characteristic spotting on the canes, leaves, petioles, and fruits. The disease most commonly attacks black raspberries and blackberries, but it is also found on red raspberries and purple cane raspberries.

In the spring, the first symptoms are small reddish-brown spots which gradually enlarge and finally appear as ashen-white areas surrounded by a reddish ring. The young tender ends of shoots are frequently entirely covered by the coalesced spots following rainy weather.

Spots on the leaves and petioles have the same general appearance as those on canes. Heavy petiole infection almost always causes leaves to drop. On the leaves, the diseased areas usually drop out producing a shot hole appearance.

During rainy weather the fungus often attacks the fruit causing it to crumble or to shrivel and dry up. Frequently the fruit spurs become infected causing them to become brittle and break off.

Control: To secure effective control, it is necessary to combine two operations. First, sanitation and, second, spraying.

Under sanitation is included such operations as (1) cultivation for weed control, insuring proper air drainage and a lowering of the moisture content of the air, thus partly preventing infection; (2) the removal of the "handles" at planting time is always advised since they are usually the means of introducing anthracnose into new plantings.

Spraying is recommended as a protection against anthracnose infection, applied as follows:

1. *Delayed Dormant:* When leaves of blossom buds are out ⅛ inch, spray with liquid lime-sulphur testing 1.03 sp. gr. or approximately 10 gallons of concentrated lime-sulphur in 100 gallons of water. Use three pounds of wheat flour or one pound of casein as a sticker.
2. *First Summer Spray:* When new canes are 3 to 4 inches high, spray new canes, using liquid lime-sulphur testing 1.006 sp. gr. or approximately 2 gallons of concentrated lime-sulphur in 100 gallons of water. Use a sticker.
3. *Second Summer Spray:* Just before blossoming, spray new canes using same material as in No. 2.
4. *Third Summer Spray:* After old canes have been removed, use same material as in No. 2.

Where infection is light, the first two sprays frequently control disease very satisfactorily. Following heavy summer rainfall, it is always advisable to apply the third summer spray. Do not spray during high humidity or high temperatures. Raspberry leaves are easily burned with lime-sulphur.

Virus diseases were once considered as a "running-out" of the plants. Within the last generation this condition has been recognized as a definite group of diseases. The virus diseases of raspberries are: Yellow Mosaic, Green Mosaic, Mild Streak, Severe Streak, Alpha Curl and Beta Curl. These diseases cause characteristic mottling on the leaves, curling and dwarfing of the leaves, streaking on the stems or crumbling of the fruit thus rendering the plants unproductive and the berries unmarketable.

Yellow Mosaic is most commonly found on black raspberries; it is also the most prevalent mosaic of red raspberries and purple cane raspberries. It is the most destructive mosaic but spreads more slowly than green mosaic.

The foliage has a distinctive yellow color which gave the disease its old name of "raspberry yellows." Diseased leaves are longer and narrower than normal ones and are variously distorted. Most of the leaf area is whitish or yellow, with occasional puckered green areas. The plant is very brittle and the fruit is worthless.

Green Mosaic does not exhibit such marked symptoms as yellow mosaic. When young vigorously growing tips of new canes are directly inoculated by aphids, the first symptom is small water soaked areas on the canes at the time of leaf development which become more extensive, resulting in the tips turning to a deep blue color and finally dying. Water soaked areas also develop on petioles of new

leaves. Diseased tips are turgid and brittle. Infected plants may die the next season or become dwarfed and produce short rosetted new canes for one or two seasons.

When older plants are inoculated with the virus of green mosaic they may not develop any symptoms other than the killing of the original infected tip usually, however, several laterals show mosaic symptoms. The following year infected plants usually have very few living canes and the newly formed laterals are short with small rosetted leaves which are usually mottled and produce practically no fruit. New canes of such plants are usually dwarfed and rosetted.

During May and June, mottling appears on leaves of plants infected with the red mosaic virus. The size of the mottled spots varies from mere dots to larger types and consist of light and dark green areas. This symptom is constant enough to be relied upon for roguing. The symptoms disappear during hot weather. In the spring, plants infected with red mosaic virus are much later leafing out, the lateness depending upon the severity of infection. This symptom can be used in spring roguing.

Streak is the most feared virus disease of the black raspberry. It has not been found on red raspberries. Two diseases are included under the term streak and are distinguished as mild streak and severe streak. Mild streak causes small damage and will not be discussed.

Severe streak is severe in the warmer berry growing areas. No definite symptoms develop during the season in which infection occurs except that the new canes are a little less vigorous, the tips of the leaves tend to bend sharply downward and the berries are inclined to be smaller than normal. Definite symptoms develop the following season. The leaves on the fruiting canes are curled; the petioles and fruit spurs are both shortened. The leaves of infected plants are darker green and the tips of the leaves curl downward and often twist in such a manner that the under surface of the leaf is facing upward. Bluish streaks are nearly always present on the stems and are most abundant near the base. This symptom gives the disease its name. The entire plant presents an appearance similar to curl. The young canes are very brittle and the fruit is inferior or worthless.

Curl—There are two types of curl; alpha curl is the common form found on the red variety, Cuthbert; beta curl is most prevalent on the black variety, Cumberland. Alpha curl attacks only red varieties while it is possible for beta curl to attack both black and red varieties. The most conspicuous symptom is a downward cupping and curling of the leaves. On fruiting canes, the leaves are darker than normal. Fruiting canes are short or entirely absent, and new canes are almost always very much dwarfed. Black raspberries soon die but red rasp-

berries persist in sending up new suckers. The spread of the disease is slow.

Control: From their very nature, it is not possible to control virus diseases by any sort of spraying. The only way this type of disease can be controlled is to use disease-free plants. It is a real saving to pay a good price for high class disease-free plants when setting out a new patch. The production of disease-free plants is no easy thing and not everybody is careful enough to produce them. In this connection let us consider how the mosaics and streak act when transferred from one species host to another.

Green mosaic on red raspberries is not so destructive but when black raspberries become infected the disease causes excessive killing of plants. To avoid this red raspberries and black raspberries *should not be planted closer than 1000 feet.*

Likewise, when blackberries are planted close to black raspberries, streak crosses over to the black raspberries and causes excessive killing of plants while little or no damage is done to blackberries. It is, therefore, not advisable to grow these two kinds of berries *closer than 1000 feet.*

It is, therefore, very evident that in order to produce disease-free plants or to have economic production in commercial fields, that they must be thoroughly isolated from all sources of virus infection.

It must not be forgotten that the virus diseases attack the wild berry plants so common along fences and in waste land as well as the cultivated plants. For this reason no wild bramble plants should be allowed to grow within 1000 feet of any cultivated raspberry patch. The real berry grower wages constant warfare against wild bramble plants near his cultivated raspberries.

Mowing or grubbing wild bramble plants will partially control them. However, they can be easily killed by the proper chemical weed killer. Recent experimental work indicates that ammonium sulfocyanate, either in the form of a crude liquor or crude crystalline, is the best chemical to kill wild bramble plants, using three pounds per gallon of water. In the summer apply this solution as a fine spray using one gallon for each 100 square feet. Avoid getting this solution on any part of the body or on clothes. It is also caustic to animals.

Another chemical that can be successfully used to eradicate wild brambles is sodium chlorate. Ask your County Agent how to use it.

How to rogue: Even the use of disease-free plants, isolation of the patch and the destruction of nearby wild brambles will not entirely control virus diseases. All certified plants have a small tolerance for disease which becomes a source of infection. It is, therefore, necessary to make frequent inspections of raspberry patches and

rogue out all diseased plants. In order not to spread the aphids that carry the viruses it becomes necessary to kill them before removing the diseased plants. This is done by scorching the diseased plants with a blow torch or weed burner, and then they can be safely removed. Since the disease-producing viruses are found in the roots as well as the parts above ground, all roots should be removed; otherwise in such plants as the red raspberry, the new suckers will be diseased.

REPORT ON THE PROGRESS OF APPALACHIAN APPLES, INC.

CARROLL R. MILLER, Secretary-Manager, Appalachian Apples, Inc., Martinsburg, West Virginia.

APPALACHIAN APPLES began work July 1st; after several months of organizing work, among officials and leading growers of the horticultural societies of the four states of this Apple Belt—Pennsylvania, Maryland, Virginia and West Virginia. It was organized as a result of steady decline in apple consumption by Americans over past fifteen years; plus curtailment of our export markets: resulting in chronic over supply of existing demands for apples.

AA is governed by the four state horticultural societies. Each society has three members on the Board of Directors. Places control and management of AA squarely in the hands of the growers themselves. Maryland's directors: Messrs. C. E. Bryan, Lloyd Balderston and G. S. L. Carpenter.

The fee basis is one-half cent a bushel on apples grading U. S. Utility and above, actually sold off the growers' orchards. Growers' statement of number of bushels sold is final basis for settlement. This is a "gentleman's organization." First half payments due November 15th; second half payments before February 15th.

A total of 540 growers signed up with AA this spring and summer. Their early estimates of their crops called for 5,150,000 bushels, Utility or above. This means, including fruit below Utility, that over six million bushels are grown by AA members. Total commercial apple production for the four states for this year was twelve million bushels. So AA has over 50 percent of the tonnage of the four states back of it—not a bad record for the first year, at all.

Pennsylvania has 186 members, estimated crop 1,350,000 bushels.

Virginia has 237 members, estimated crop 1,800,000 bushels.

West Virginia has 68 members, estimated crop 1,507,000 bushels.

Maryland has 49 members, estimated crop 506,000 bushels.

This 4-state total of 5,150,000 bushels at ½ cent per bushel would

yield a maximum of $26,000 GROSS. The Board of Directors played safe; allowed for chances, crop failures, uncollectibles, etc.; and set the year's budget at $19,000. Determination was made, and has been held to, not to exceed that until money is safely in hand; to pay as we go.

Total paid in to date, from all four states: $13,165, reports Treasurer Malcolm M. Brown. Penna. paid in to date $3,801; Virginia, $3,201; Maryland, $1,261; and West Virginia, $4,648; Allied Industries, $125.

We need the balance of the money at once and cannot proceed with the program until we have additional funds. We need the full $6,000 more to carry the balance of the year's program, in the minimum. All bills are paid, including the big bills for the printed, lithographed and die-cut grocery-store display materials; three million AA master-labels, of which 2¼ million were used this fall. We have paid out $11,957 and have a balance (as of Jan. 6) of $1,207. This is "earmarked" for the Baltimore, Md., "test city" campaign we are now arranging there. The campaign opens Jan. 22 continuing through February 5th; with complete newspaper and radio advertising backing up the intensive work of organizing the grocers of the city.

We have lined up 1,800 grocery stores in Baltimore to aid in this. Of these 1,800, at least 525 of the largest will aid by using their own advertising space to boost apples and will arrange apple displays in their own stores, in addition to using our display materials. The A. & P. stores (250); the American Stores (200) and the Sanitary Stores (75); will carry this complete assistance—displays, their advertising, and our display materials; many of the 1,200 other stores will advertise also. Baltimore is the first city in which a complete "test" campaign has been made. Late arrival of funds from growers delayed this work. We could not proceed until we knew the money was coming in, for certain. The small budget this year ($19,000) has kept us from using many methods of advertising and sales promotion which we know are very valuable—have proven their value with other fruits. We have not been financially able to do any health work among children and schools; nor among physicians; little or no direct advertising; few food shows; a number of such things had to be foregone, regretfully.

The decision of our Board of Directors was to center our efforts on "Grocer Service"; because of value of this work and because it can be carried on with limited funds. One man can work at this, in a field as large as he can cover; or five men can work a field five times as large. We have one grocer-service man, James A. Higgs; should have more. Higgs has "worked" Louisville, Ky.; Cincinnati, Ohio, Charleston, West Va.; and is now working Pittsburgh, Pa. He will return to Baltimore to wind up details of the campaign there;

and the week of Feb. 25, Higgs and Secretary Miller who together worked Baltimore for the campaign, expect to go to Philadelphia, to put on an organization campaign among the grocers there. But they will not be able to use the complete program. Not enough money seems available now to use newspaper and radio backing, except what we can persuade the bigger stores and chains who use these themselves, to give us. Newspaper and radio coverage in Philadelphia would cost something over $3,000. Unless payments come in in a hurry, that amount will not be in hand, and we will have to do the best we can without it. The newspaper and radio assistance is very valuable and desirable in this work. But much good can be done without it. By organizing the grocers, we can stir them to put additional effort into selling apples to their customers. The grocer is "key man" in food distribution. He can either increase apple sales by displaying and "pushing" apples; or he can cut down apple sales by putting them in out-of-the-way places in his store and pushing something else. So he is a valuable man to work with.

We furnish the display materials to those groceries asking for it. We supply it in "store sets"; each set rolled or packed, and including:

1 "laughing apple" window streamer, lithographed in 4 colors.

2 "laughing apple" window or store interior posters, lithographed.

50 rotogravure folders, containing recipes and apple information, to be placed on the store counters; customers helping themselves.

2 price cards, to fit over apple basket or display bin.

2 grocer newspaperettes "THE APPALACHIAN APPLE BASKET", for store manager and staff. This piece emphasizes two things we hope to get across to the grocer—the nice profit in handling apples; and the ease with which apple displays can be built, in store windows or interiors.

These sets cost us about 26 cents each. They are given to grocers without any cost. But only to grocers we are satisfied will make good use of them. The grocers really approve of this line of display materials. They tell us it is "Good Stuff"; attracts customers' interest in apples. Grocers are glad in most cases to receive it and in many cases go to some length to stage apple displays to go along while they are using it. We ordered a million of the rotogravure folders; 80,000 of the "laughing apple" streamers; 50,000 recipe books; the supply of which is almost exhausted now and will have to be reordered, with improvements.

So far, we have placed (or are placing) this display material in 8,760 grocery stores, principally in the cities and adjoining areas of Louisville, Cincinnati, Charleston, W. Va., Baltimore. Within a few days we should have several thousand sets in Pittsburgh stores, as

Higgs is working there now among the grocers. We "work" these cities as fast as we can. We expect to work Philadelphia shortly; several smaller Southern cities; and a couple of more Northeastern cities, before the apple selling season stops, about April 1st. In these 8,760 grocery stores into which we have reached, we have placed 517,000 pieces of apple advertising material; principally the rotogravure folder, of course, as fifty of these go into each store. We have already used 380,000 of these; will have practically the entire million placed before we finish work this season. Then we have put out 106,000 Variety leaflets; for Stayman, York, Rome and the different varieties; telling something of the best use of that variety; giving some recipes, etc. They go on top of the basket face; just under the lid; one or two or more to a basket. The growers pay most of the cost of these. We furnish them at $1.50 per thousand leaflets; and they can be printed with your own orchard name at a slight added cost. They are effective—get into the consumers' hands; for we have received many calls for the recipe book mentioned on the leaflet.

We have been very fortunate with our publicity work this far. Four of the biggest dailies of the Central East have given us full pages of apple pictures in their Sunday rotogravure sections—the Pittsburgh Press, Baltimore Sun, Washington Star and Washington Post. A number of important magazines have given us full feature articles on apples, with pictures; and we have a whole file of newspaper and magazine articles of smaller size. This is most valuable advertising. Advertising men call it "tradition building". And it is the most effective way to combat the spray residue fear and propaganda. It builds up solid confidence and liking for the Apple Industry. We owe these newspapers and magazines a real debt of gratitude for their fine cooperation in this.

We have been busy also with a lot of lesser things—National Apple Week, when we had special display windows in Pittsburgh, Philadelphia and Washington; The Apple Fair at Martinsburg; a Pittsburgh cooking school; an International Apple Association convention; at the Pennsylvania Farm Show; with Kiwanis Clubs and other organizations: building up a file of apple photographs, and files of health and nutrition work in apples.

We have gotten out letters to practically all the better apple buyers and handlers of the United States; and to many in Europe, telling about AA. As a result, we have our display materials in England, Holland, Palestine, in small quantities, of course, as well as in the United States. And we have attended to the correspondence from our 540 members. If any one thinks keeping up with correspondence from an organization of 540 members is a light job, let them try it once. We have distributed 2¼ million AA Master-labels to our members.

This is a brief, sketchy report of our activities the first six months of our life. Apple sales promotion is new work. It has to be learned by trial and experience. Other fruits and vegetables have their promotion work; and their methods in part are adaptable to apples; but not as a whole. Apples are a separate product, and must be promoted in their own way. We are learning rapidly.

As to results—we are not claiming any, definitely, this first six months, for AA alone. But we do say that, working in conjunction with the four other regional apple advertising organizations, namely, Washington State Apples, Inc., and Pacific Northwest Fruits, Inc., each with $150,000 to spend; and with New York-New England Apple Institute, the National Apple Institute—AND APPALACHIAN APPLES—that the American public has been reminded of apples many, many more times, and more favorably, than it has been before. We see that results of this are showing. Cold storages are emptying faster than they did last year; particularly in the Northwest. The Washington State apple crop was 1,000 carloads less than last year; but they have already shipped out 2,000 MORE carloads of apples than they had this time last year. All U. S. cold storages emptied at the rate 21% in Dec. vs. 15% in Dec. last season. It seems that people are eating apples more freely than they have for several years. The prices of apples went up steadily during the apple-harvest season —a phenomenon in itself; and have held to a very satisfactory price level. Allowing fully for the short national apple crop and all other factors, it still seems established that apples are moving out faster; and at much higher prices, than last year. This is certainly due in part to increased consumption stirred by advertising, publicity and grocer service work by the apple promotion organizations. Results in this are slow; particularly where the money invested is small. Sales promotion work is a steady, long-time, cumulative job.

Here is a graphic way of showing the solid foundation under Sales Promotion work; which is a broad field including advertising, grocer service work, education of the public, and last but by no means least, packing fruit that is continuously better and more appealing to the public. There are something over 25 million housewives in the United States. They buy, for cooking or eating out-of-hand, an average of 80 million bushels of apples each year. (The 5-year average commercial apple crop of the United States is 96½ million bushels; and an average of 16 million bushels have been exported, from this; leaving 80 million bushels to be used at home, according to U. S. Department of Agriculture.) The 80 million bushels among the 25 million housewives means that each household averages about three bushels per year;—or 150 pounds of apples. If, by sales promotion —advertising, grocer-service, publicity and education—we can persuade the average housewife to increase her apple purchases by just

10 per cent—to buy 15 pounds more apples than she did last year—the total 25 million housewives purchase eight million more bushels of apples than they did the previous year.

Consumption of 8 million bushels of apples means what? In 1924 the commercial apple crop was 87½ million bushels. The average price to the grower at the orchard was $1.21 a bushel. In 1927 the commercial crop was 78½ million bushels—9 million less. The average price received was $1.40 a bushel—nineteen cents a bushel more. Both were good average years, industrially and every other way. Almost exactly the same amount was exported both years. The two years are strikingly fair and alike for comparison. The difference of 9 million bushels made a difference of 19 cents a bushel in the growers' return, in effect. That 19 cents a bushel means $14,800,000 on the 1927 crop; nearly fifteen millions of dollars more for the growers, for the same number of apples.

It seems then a reasonably fair demonstration that an outlet or market for nine million bushels of apples is worth something like fifteen million dollars to the apple growers. Well, a ten per cent increase in apple usage means just about that; a market for 8 million additional bushels. A 10 per cent increase in apple usage is an easy task, given sufficient funds to swing an adequate promotion job. Apples are "The Forgotten Fruit." People like them; need only to have their attention called to the Apple to react favorably, we have found. A 10 per cent increase in apple usage can be had for much less than $15,000,000. It would on this basis be excellent business—200 per cent business—to invest five millions in apple promotion; to secure the fifteen million additional income. A 5-million-dollar program would mean about 5 cents a bushel. California is now paying 4.8 cents. Like any other business, the returns you receive from Sales Promotion depend on the investment you make in it, on the whole. Like spraying, it should be well done to achieve the best results. A partial job of spraying is better than no spraying at all; but a real, bang-up, full-coverage job of spraying is far better, in dollars and cents, year in and year out. So it is with this sales promotion work. It is as essential as spraying;—for what is the use, after all, of investing good hard dollars in spraying to get clean fruit, if the fruit will not sell after we have our money tied up in it. Apples certainly need some insurance against such years as 1926; and '32 and '33; and plenty of other years when the Public didn't particularly want our apples, because they had been taught to want other fruits.

The Apple Industry is a Business. It must keep step with other Business. Sales promotion is a part of modern business methods. It must be a regular part of the Apple Business. We may or may not like this. We don't like to spend more money on our apple

production. We did not like to spend the money for spraying machines and spray materials, years ago when the Scale and the codling moth got bad in our orchards. We hadn't had that expense before. But we found that to stay in business we had to spend the additional money. So it was with oiled paper; and washing; and better packages. They have simply become essential in growing good apples. It is exactly so with sales promotion; that whole field which includes advertising, grocer service, public education and such things. Our competitors are doing these—and doing them well. Just as the apple grower who put off buying a sprayer for years after his neighbors had gotten theirs was the apple grower who fell by the wayside; so it will be with apples, if we do not keep up with our competitors.

MAKING THE DELICIOUS APPLE BEAR PROFITABLE CROPS

M. A. BLAKE, Head, Department of Horticulture, Rutgers University, New Brunswick, New Jersey.

Actual profit from a crop of apples involves harvesting, marketing and price as well as production. In the limited time available I shall confine my discussion to production. To discuss intelligently the yields of fruit that any variety of apple should produce it is clear that we should first note its inherited ability because that in itself places a limit on production. My observations of the Red Delicious variety have been made largely in New Jersey and my conclusions are necessarily largely drawn from that experience. In the accompanying table No. 1 are reported the average annual yields per tree obtained from Delicious, Rome and Stayman trees set in 1927. All began fruiting in 1932 or the fifth summer after planting but Delicious was 2 to 3 years later in producing a commercial crop than Rome. I think that this is fairly characteristic of the variety in New Jersey.

TABLE 1

Average Yield in Bushels per Tree of 3 Varieties of Apples at New Brunswick, N. J.

Variety	1932	1933	1934	1935	1936	Ave. per Year
Delicious	.12	.29	.69	2.83	1.07	1.00
Rome	1.12	1.42	1.96	4.08	1.71	2.06
Stayman	.89	.91	1.68	4.65	.34	1.69

Trees set in 1927.

In the accompany Table No. 2, are reported the comparative yields of 9 varieties of apples for a period of 14 years in an orchard planted upon rather poor soil and given medium good fertilization. McIntosh

and Gravenstein have produced outstandingly larger yields than the others. Baldwin should have a much better record but it has been fertilized and managed on the basis of the needs of the Delicious which results in an over-vegetative growth status for Baldwin.

TABLE 2

Average Yield in Bushels per Tree of Apples at New Brunswick, N. J.

Variety	1932	1933	1934	1935	1936	Ave. for Last 5 Yrs.	Ave. 14 Yrs.
Baldwin*	8.1	14.6	2.1	8.9	6.1	8.0	6.9
Delicious*	5.8	7.3	4.9	8.6	7.9	6.9	5.8
Gravenstein*	6.7	14.8	4.6	19.6	6.8	10.5	9.1
Grimes	.6	9.7	4.2	18.4	1.0	6.8	6.5
McIntosh*	19.0	14.7	11.3	27.2	14.7	17.4	12.5
Paragon	2.8	11.2	2.8	19.9	1.9	7.7	8.0
Stayman	14.0	2.8	10.3	6.2	10.3	8.7	7.6
Wealthy	3.6	10.2	2.3	11.3	4.0	6.3	6.0
Williams	6.8	8.5	2.3	8.0	3.5	5.8	4.8

54 Trees per Acre until 1935. *27 Trees per Acre in 1935 and 1936.

Stayman and Paragon have outyielded Delicious. In fact, the latter has rated about with Wealthy. It should be stated, however, that the yields of Delicious were reduced in this orchard for several years as a result of calcium deficiency. Taking all factors into consideration, however, it appears correct to say that Delicious is not equal to either McIntosh, Gravenstein or Rome in inherited ability to produce apples and particularly so while the trees are young. Gravenstein might be an exception north of New Jersey where it tends to come into bearing later. It appears fair to conclude also, that under New Jersey conditions Delicious rates about medium in productiveness if conditions are favorable. The variety is, however, very sensitive to its growing environment and may easily rate low in production with other varieties.

In the case of all varieties that are only medium in production I would plan to set them 40x40 with a tree in the center of each square which means 54 trees per acre. This should double the production per acre for a period of at least 10 to 20 years in New Jersey over an arrangement of trees set 40x40 without fillers.

The next phase of the problem is to obtain maximum production per tree. In order to efficiently promote the production of maximum and consistent crops of large well colored apples upon trees of a given variety it is necessary to know something of the factors involved in fruit bearing. The fact is well known that animals require both proteins and carbohydrates for growth and maintenance and that these are fed direct to domestic animals. Plants also require proteins and carbohydrates in order to grow and exist but the carbo-

hydrates cannot be supplied either by the soil or from the fertilizer bag. A plant such as the Delicious apple must manufacture or synthesize all of its carbohydrate requirements. This is accomplished by the action of the green coloring matter which is largely found in the leaves. In plain terms the leaves of the tree are its starch factory. Large, thick, healthy, leathery leaves are the most efficient "factory hands." Thin, weak, injured or diseased leaves are much poorer "factory workers."

In the wild state, nature is concerned chiefly with the growth and conditioning of plants to a degree which will insure reproduction. Man, however, is not satisfied in obtaining a certain number of seeds from an apple tree. In fact, in the majority of cases he does not care whether he obtains any. In the case of the Baldwin apple, for example, man desires a large volume of pulp around the seed cavity and even then he is not satisfied unless it is of a certain texture and quality and enclosed in a brilliant red skin. Furthermore, the apple grower wants each mature Baldwin tree to produce 25 to 50 bushels of apples *every* year and not *every other* year. It requires large amounts of starch and sugar to produce a big crop of apples, not to mention the amounts required for the maintenance of a large trees. This means that the tree must possess and be able to operate a large and efficient "starch factory" of its own. It means further a large volume of healthy uninjured, thick, leathery leaves. When you burn apple foliage by sprays you, in reality, set fire to the starch factory. When insects, diseases, hail or any other factor causes damage to the leaves it reduces the capacity of the factory. In order to have strength, endurance and good health, a person must maintain a proper balance of carbohydrates and proteins in the body. The trainer of a track athlete is not merely concerned that his charge is supplied with plenty of carbohydrate and protein foods. He knows that the runner must attain what is termed "condition," if he is to set a fast pace and maintain it. A good trainer and coach can judge the physical condition of an athlete by his external appearance and response to exertion.

What has this to do with plants? Any successful grower of specimen pot plants, for example, studies in great detail the variety of plant which he is growing. He observes its temperature, light, moisture and nutrient requirements at all stages and how it responds to each detail of culture. He finally obtains a series of mental pictures or impressions of how the plant looks at different stages of development when at its best and also how it looks when it is adversely affected by improper care and other unfavorable influences. Furthermore, the expert plant grower "conditions" small plants such as cabbage and tomatoes before they are transferred from greenhouse or coldframe into the field. From a scientific standpoint, plant "condi-

tion" is determined by the carbohydrate-protein relationship within the plant. For example—a soft succulent plant is relatively high in protein and moisture and low in carbohydrates. In contrast, a slow growing "hard" plant is relatively much higher in carbohydrates and lower in protein and moisture.

It is a well established fact that a fruit tree will not set fruit buds and produce fruit until it develops a sufficient reserve of carbohydrates within the plant. A very young fruit tree does not develop spurs and fruit buds because it utilizes a large proportion of its carbohydrates in extension of linear growth of tops and roots. If a fruit tree continues to be excessively vegetative year after year it will be late coming into commercial production, tend to bear irregularly and the fruits will be of poor color and quality. It is the rather common impression that an over-vegetative plant has thick succulent stems. This is the reason why the growth status of apple trees is likely to be misjudged. An over-vegetative condition may result in slender twigs and many of them. Leaves may be small and thin and not large. The term "over-vegetative" is now used to designate a low proportion of carbohydrates to proteins within the plant.

Apple trees may also be unproductive because they are deficient in protein. Apple trees lacking nitrogen make a short, slender annual growth, the leaves are small and light green to yellowish in color. The bark will be relatively light in color and uncertain crops of small fruits will be produced. It is quite easy to distinguish a tree which is unproductive because it is over-vegetative from one which is unproductive because it is under-vegetative. In other words, one can judge whether an apple tree is high or low in carbohydrates and proteins by the external appearance of the tree. A chemical test is necessary in the majority of cases. Two extremes of tree condition or growth status have been described which are associated with a low degree of fruit production. This suggests that there is a growth status which is most favorable for production. This is not a new discovery; in fact, it is very, very old. Expert gardeners in Europe in the 17th century understood that there was a relationship between kind and amount of growth and fruit production. They managed and trained fruit trees to promote fruiting by means of mental pictures of tree condition.

The external characters of a tree such as leaves, twigs, flowers and fruits are the outward manifestations of what has and is taking place within the plant. Fortunately, therefore, we can judge the internal composition of a tree rather accurately by its external characters. To do this in a practical manner, we need standards or "yardsticks" so that estimates can be quickly and accurately made. Such standards have been established for the Delicious apple under

New Jersey conditions. It was observed in 1928 that the length of the blades of the spur leaves of the Delicious apple could be used as a measure of vigor and the shape of the blade as a measure of composition or quality. A summer standard for judging the growth status of the Delicious apple was therefore established on the basis of the length and form of the blades of the spur leaves. Later a winter standard was established on the basis of the diameter of spur fruit buds and correlated with the summer standard. The combined standards are printed in the form of a chart.

NEW JERSEY STANDARD FOR JUDGING THE GROWTH STATUS OF THE DELICIOUS APPLE

Summer

Class	No. Leaves	Length Blade Longest Leaves	Width to Length Ratios A	Width to Length Ratios B	Yield, Size and Color of Fruit
		Inches	%	%	
1	1-2	4.0+	35-49	50 & +	1A Best size and color
	3-5*	3.5+			1B Color deficient
2	1-2	3.5+	35-49	50 & +	2A Good size and color
					2B Color deficient
3	2-3	3.0+	45-50	51 & +	3 Crop and fruit size small or doubtful
4	0-1	3.0+	45-50	55 & +	May bloom; unfruitful

*Includes any that are 4.0 inches or more.

Winter

Class	Classification of Spur Buds 1	2	3	4
Size (Inches)	0.22 and up	0.19-0.21	0.15-0.18	Less than 0.15
	Fruitful	Fruitful	Will bloom Crop doubtful	Very few blooms Unfruitful

Trees of Class 1 and Class 2 growth status are productive for the variety. Trees of Class 3 growth status are uncertain in production. They bloom and set fruit but it may drop in June and result in a very light yield. Trees of Class 4 growth status may develop some bloom but it will not set fruit. Delicious trees of a Class 1 or 2 growth status can be quite readily distinguished from those of a Class 3 or 4 by the general appearance of the trees. There are many external plant characters which should be employed to supplement size and form of spur leaves and diameter of spur buds in judging the growth status of Delicious. These include diameter of annual

twig growth, color of bark and proportion of spurs to shoots. When a Delicious tree is so actively vegetative in early spring that it produces a high proportion of shoots as compared to spurs it indicates an over-vegetative condition. Long but slender annual twig growth at the ends of branches is another indicator of such a status.

Production Uncertain.—Complaints are not infrequent that orchards of Red Delicious sometimes fail to produce commercial crops even when the trees are 10 to 14 years of age. These complaints come from as far south as Tennessee and from a considerable distance westward. The Red Delicious thrives best upon a well aerated soil. It is inclined to be too vegetative upon a dense, deep soil and especially where temperatures are high and clean tillage is practiced. When the trees are young they can be easily induced to become over-vegetative by excessive fertilization and particularly with nitrogen upon good soils. The Delicious is very sensitive to calcium deficiency apparently much more so than McIntosh, Paragon or Wealthy. The fruits become small and the growth status quickly drops from a Class 1 or 2 to a Class 3 in one orchard at New Brunswick.

In the experience of the writer, where Delicious trees have failed to come into bearing normally, the cause has been due either to a too heavy soil, too liberal fertilization, unbalanced fertilization, a deficiency of calcium or a "dead soil." The latter term is applied to mean a soil lacking in several fundamentals of fertility including organic matter. The solution of the problem in each case is first to determine the growth status of the tree. This will suggest the possible factors which may be involved. The procedure then is to try to determine which one or more are actually responsible and to correct the unfavorable condition.

IS MULCHING A PROFITABLE PRACTICE IN THE ORCHARD?

J. H. GOURLEY, Chairman, Department of Horticulture, Ohio State University, Columbus, Ohio.

I like the way this subject was stated for it puts the chief emphasis on the word "profitable." It is one thing to grow good fruit and it is quite another to turn a profit from the procedure. True, this is a rather shop worn subject yet there never was a time when the handling of the soil was more uppermost in our minds than today. This subject is in the form of a question, so I will follow his lead and ask a few myself.

What factors would you consider entered into the profitableness of any cultural practice? If I may venture to suggest a few they would certainly include:

(a) Conservation of the land itself. Of what avail is it to grow

good crops if by so doing the land washes or blows away or the important ingredients are exhausted?

(b) Is the total yield sufficient to turn a net profit? Again what is gained if the soil is conserved and the fruit is of high quality but it costs more to produce it than it can be sold for?

(c) Does the system reduce color, encourage blemishes, reduce or increase size to an unprofitable point; in other words, impair the quality of the product?

Now let us examine each of these three questions in the light of some forty years experience with the mulch system even though not all results in Ohio are applicable to Maryland conditions.

1. Mulch as a Means of Soil Conservation. First, it may be said without the likelihood of contradiction that no one type of soil or soil management is essential for fruit culture. But long experience has shown that a soil which is naturally well drained and in which the roots can penetrate to a depth of from three to five or six feet will produce trees that are more reliable as to length of life, regular bearing, ability to withstand adverse conditions of drought, excessive rainfall, and low temperatures than one which is shallow (18 inches to three feet). There are some exceptions to this, particularly where trees are planted over ledges of stone and the roots penetrate into crevices of the rocks, but in the main it is true. While most of the tree roots occupy the surface two feet, yet in a deep soil there are many roots extending to a much greater depth.

The suitability of a soil for orcharding may be determined in part by its color and the absence of a hard-pan or impervious layer in the subsoil. If the color is brownish or reddish it indicates good drainage and sufficient air for root activity. If the soil is bluish or grey or if it is mottled in color it indicates poor drainage and is unfavorable for root growth. No surface treatment of the soil can materially change the nature of the deeper lying strata, hence it is of the greatest importance that a suitable soil be selected at the beginning.

Once a soil is selected then the cultural method should be one that conserves moisture; supplies sufficient nutrients for maximum production; and adds sufficient organic matter to offset any loss due to decomposition, erosion, or other factors. It should also prevent erosion and avoid serious compacting of the soil so that aeration is maintained.

The chief systems of orchard culture involve either tillage with cover crops, or sod. If the latter a mulch may or may not be used. Usually it is not. It is the mulch system, however, which I am asked to discuss primarily, and the three questions asked above will be applied to it.

Conservation of the Land

By common consent, one of the chief means by which the soil itself is lost is by erosion, either through the agency of water or wind. Throughout the eastern part of the United States wind is not considered important in this matter. But the most casual observation will show that water erosion is most serious. It is quite obvious that such water action can go on actively only if the land lacks a permanent cover, such as a sod. When the sod is plowed up it may take a long time to get another good ground cover. One should, therefore, be sure of his program before tearing up an orchard with the worthy intention of following a soil-building program. The horticulturists may be accused of traveling in circles in this matter, but in so doing we have certainly learned some things. There is no method of orchard culture that so completely stops erosion as sod and if to this is added a mulch the same results are secured plus a greater penetrability of the water from rain and a looser more friable soil which permits of better soil aeration than under either sod or cultivation.

Taking some data furnished me by the Soil Erosion Experiment Station at Zanesville, Ohio, we have the effect of the penetrability of water after a prolonged drought. On August 2, 1934, a rain of 2.45 inches fell. On bare washed soil the rain penetrated 1½ to 2 inches; in a timber lot with good cover it penetrated 8 inches; in a meadow 4-5 inches; in blue grass sod 7 inches; in a corn field between rows 2 inches. Here we have the extraordinary difference of nearly 400 per cent greater penetration of water on a blue grass surface than on bare, cultivated soil.

An example of erosion in an Ohio orchard came under my observation during the past two years. The orchard was on rolling land and had been in sod but the owners had been advised that it would be better to plow it and grow cover crops for a time. This was done and at the end of two years he was hauling hay and brush into the gullies which were rapidly destroying the surface. I have not often seen such evidence of the destruction which may come with a well-meant system which lays the soil bare during a time when heavy rains may occur.

What about the soil moisture content of orchards in sod, tillage, and mulch? If the results at Wooster may be taken as typical of that section of Ohio it is evident that during periods of continued drought, the soil under mulch is highest in moisture, while the land in sod and tillage were about equal and distinctly below the mulch.

Soil nitrates have always been favorable although frequently not so high as in the tilled area where cover crops are annually plowed under. They are usually low under sod alone.

Organic Matter

Much has been written upon the subject of organic matter and yet I venture the opinion that there is more confusion in the minds of most of us on this question than most any other in the whole realm of soil studies. Its exact chemical and physical state and the role it plays are both somewhat vague. In agricultural parlance organic matter may be defined as plant and animal remains which have been incorporated in the soil.

I believe the average orchardist thinks of organic matter as the dark-colored decaying plant residue mixed through the soil particles, much as would be true if a sponge were cut into minute shreds and mixed amongst the soil particles, which is what happens when it is first added to the soil. But in addition to this concept we must remember that much of the fresh organic matter is readily decomposed in the soil furnishing readily available nitrogen and other plant materials and also breaks up and disappears as carbon dioxide gas. This portion of the organic matter is determined along with the undecomposed portion and hence gives a somewhat wrong impression so far as changing the structure of a soil is concerned.

That one can build up a large amount of organic matter as a "bank account" to be drawn on in future years even under the best of agricultural conditions is largely a false conception. The supply must be maintained annually if the soil is cultivated and for that reason a complete fertilizer should be applied over the entire orchard area in order to produce large, rather than meagre crops to return to the soil.

There is undoubtedly a net loss of organic matter where the land is cultivated and inadequate cover crops are produced, probably even with good cover crops. Loss occurs by erosion and oxidation and reduction or "burning out" of the organic matter. For this reason land kept in sod or mulch will lose less of this soil humus than carelessly-handled cultivated soil.

One of my associates has been determining the amounts of organic matter present in certain of the orchards at the Ohio Station. Here we have orchards which have been in the mulch system continuously for 37 years. Other blocks have been cultivated with cover crops, while others have been in sod land. This gives an excellent opportunity for such determinations. His results show that there is a gradient in organic matter from the surface downward under all treatments. Second, that there is no great difference in organic matter in the soil beneath the mulch and beneath sod. And third, the greatest difference is in the low organic matter content in the cultivated area.

This is a challenging fact to those who follow an intensive system

of tillage. For not only is there a considerable loss due to erosion but also due to rapid oxidation, and perhaps to leaching of the soluble nitrates released from the decomposing organic matter.

2. Is the Yield Sufficient to Turn a Net Profit? There are a good many experiments to show the comparative yield of fruit from tilled and mulched orchards. The results vary somewhat but in the main there is not much difference. I may cite a case from the orchards at Wooster where one block was planted in sod land in 1915 and the mulch system was started at once and another block adjoining planted at the same time and tillage with cover crops followed throughout. The yield records are as follows:

TOTAL PRODUCTION PER TREE THROUGH 1935

Trees Planted 1915

Treatment	Variety	Yield in lbs. Av. per tree
Cover crop	Stayman	6942
Cover crop	Delicious	5342
	Average	6142
Grass Mulch	Stayman	6265
Grass Mulch	Delicious	5437
	Average	5851

During the first few years the yield and value of the fruit has increased somewhat on the mulched plot as shown by the following figures compiled by C. W. Ellenwood.

VALUE OF FRUIT PER TREE (Av. Per Tree) 1926-1935

Varieties Delicious and Stayman

Treatment	Average 1926-1935	Average 1932-1935
Cover crop	$14.87	$13.44
Grass mulch	13.63	14.27

In addition to this orchard we have a variety block planted in 1893 and which has been in the mulch system for the past 37 years. While no tilled plot is available for comparison, the production record of this orchard is impressive. The trees were set 33 feet apart, which was too close and some shading effects have long been evident. The following record is for some of the better known varieties.

AVERAGE ANNUAL YIELD OF 15 VARIETIES
26-YEAR PERIOD—1910-1935

Variety	Av. Annual Yield Bu.
Baldwin	15.4
Ben Davis	15.4
Grimes	19.
Jonathan	16.8
McIntosh	16.1
Northern Spy	14.4
N. W. Greening	21.9
Oldenburg	13.1
Red Canada	14.4
R. I. Greening	21.0
Rome Beauty	17.5
Stark	13.2
Wealthy	8.4
Yellow Transparent	12.3
York Imperial	13.7
Average	15.5

Taking the whole crowd together they have averaged over 600 bushels per acre for 26 years, which is indeed impressive. The site is favorable and likewise the soil, but apparently the mulch system has not been detrimental.

Yes, there are certain hazards connected with the system just as there is with cultivation but these must be guarded against. Fire and mice are perhaps the greatest, and occasionally serious damage is caused from one or the other of these agencies. But there is nothing in our work to suggest that the trees are short-lived or subjected to any special disease or insect problems which cannot be controlled.

3. Does the System Reduce Color or Quality of the Fruit? For a long time I was under the impression that color of fruit was improved where a mulch was used. Our experience does not bear this out at Wooster although I have seen cases where it seemed to be true. It is likely that in such cases either excessive nitrates were produced by cultivation or else insufficient mulch was used. Ordinarily the highest color will occur in sod or where insufficient nitrogen is used.

Size has been greatest in our mulched areas, probably because of greater or more uniform moisture supply. Large size is dangerous, particularly with varieties that are subject to bitter pit or other physiological troubles. The increase in size under mulch has not been recorded, as yet, as objectionable.

In other respects the apples under mulch are at least of as good quality as those grown with cultivation.

But of all the evidence at hand perhaps there is no greater benefit than that of conserving the soil and avoiding the depletion of organic matter. Both tillage and mulch can be made to work satisfactorily if conditions are favorable but the mulch system is on the increase rather than the reverse.

COMMITTEE REPORTS

The Committee Reports were requested by President Bryan. Mr. J. G. Harrison of the Auditing Committee reported than an examination showed the accounts of the Treasurer to be in order.

Report was accepted by unanimous vote.

Mr. W. Lee Allen of the Nominating Committee offered the following nominations:

President—C. E. Bryan, Havre de Grace.

First Vice President—G. William Gardenhour, Smithsburg.

Second Vice President—Joseph G. Harrison, Berlin.

Secretary-Treasurer—A. F. Vierheller, College Park.

Executive Committee—R. S. Dillon, Hancock; W. Lee Allen, Salisbury; Edmund P. Cohill III, Hancock; A. Lee Schrader, College Park; O. R. Higgins, Hurlock; G. S. L. Carpenter, Hagerstown; Lloyd Balderston, Colora; G. Rust Canby, Silver Spring; Fred R. Sloan, Lonaconing.

Representative to Maryland Farm Bureau Federation and Maryland Agricultural Society—Henry C. Whiteford, Whiteford.

Report was accepted by unanimous vote.

Mr. J. A. Caspar of the Resolution Committee offered the following resolutions:

WHEREAS: We realize the value of meeting with fellow fruitgrowers from our neighboring states of Virginia, West Virginia, and Pennsylvania and have enjoyed and profited by the exchange of ideas with them individually, and

WHEREAS: We believe our problems and interests are so closely allied as to be practically common problems and interests, and

WHEREAS: We believe that a close association between the fruitgrowers of our four States would be of inestimable value in our efforts successfully to meet the problems which will confront us, now, therefore,

BE IT RESOLVED: That our officers should confer with the officers of the Horticultural Societies in the other three states, to see what can be done to bring about the closest possible cooperation between the four Societies, and be it further

RESOLVED: That our officers suggest the advisability

First,—Of Joint Annual Meetings;

Second,—Of a joint publication of outstanding merit and value;

Third,—The formation of a Four-State Association of Fruit-Growers, to be organized and operated along efficient lines for the material advantages to be mutually gained.

In the discussion, representatives of the Virginia and Pennsylvania Societies stated that this matter would be brought to the attention of their organizations. Mr. C. R. Miller, Secretary of the West Virginia Horticultural Society, stated that he feared that his Society would not vote favorably, if the plan was to discontinue the individual State meetings, as the smaller growers were an important factor in his State. After it was explained that the resolution would not affect the State meetings, but called for an additional meeting at some central point, the resolution was adopted.

RESOLVED: That the Society go on record as favoring an emergency supplemental appropriation by the State Legislature, of $5,000, to be made available at once, to aid in expediting shipments of farm produce and nursery products, by the employment of additional Japanese Beetle inspectors.

WHEREAS: The attendance at these meetings has been excellent, drawing growers from our neighboring States; the program has been of excellent content; the educational and commercial exhibits have added so much to the success and educational value of the meetings; and the hotel accommodations have been so generously given over to our Society. Therefore, be it

RESOLVED: That we hereby express our appreciation to the secretary and program committee for this program; to the speakers who have given us the benefits of their research and experience; to the staffs of the Department of Horticulture, Experiment Station, and Extension Service for the educational exhibits; to the commercial exhibitors and advertisers in the Maryland Fruit Grower for their fine cooperation; and to the management of the Alexander Hotel for their efforts in making our meetings convenient and comfortable.

WHEREAS: In the past year we have lost a loyal member of the Executive Committee in the passing of Mr. N. C. Graybill, of New Windsor. Therefore, be it

RESOLVED: That we have a deep regret in the loss of this true friend and active co-worker; that we extend our sincere sympathy to the family of the deceased; that a copy of this resolution be sent to the family, and also be placed on the permanent records of this Society.

These resolutions were adopted unanimously.

Adjournment.

REPORT

OF THE

THIRTIETH ANNUAL MEETING

OF THE

Maryland Crop Improvement Association

Baltimore, Maryland

January 13-14, 1937

AND OF THE

STATE CORN SHOW

PROGRAM

Wednesday, January 13, 1937

9:30 A. M. Call to Order by the President, Matt Harding, Cambridge.

A. Soybeans

1. Recent Developments, Uses, Progress and Possibilities
   F. H. Shelby, Allied Mills, Portsmouth, Virginia
2. Soybeans in Maryland Rotations
   Professor J. E. Metzger, University of Maryland
3. Discussion—Markets and Uses of Soybeans in Maryland
   Led by Kenneth W. Baker, County Agent, Centreville
   Continued by Oliver Jones, Centreville

B. Progress in Cleaning and Treating Wheat and Barley in Maryland, with Reports and Exhibits
   Discussion led by J. D. McVean, County Agent, Chestertown
   Continued by W. H. Carroll, Towson

Thursday, January 14, 1937

9:30 A. M. Call to Order by the President

A. Permanent Pastures

1. Problems for Eastern Shore Conditions
   Professor George L. Schuster, University of Delaware
2. Problems for Western and Northern Maryland
   Fred Grau, Pennsylvania State College

B. Hybrid Corn

The Present Situation and the Result of Trials
Russell G. Rothgeb, University of Maryland

C. Secretary-Treasurer's Report

D. Election of Officers

SOY BEANS—RECENT DEVELOPMENTS

By F. H. SHELBY, Allied Mills
Portsmouth, Va.

Within the last year nearly all newspapers, magazines and trade papers in the United States have published at least one article on the soybean. It has been referred to quite generally as the "Magic Plant." It is not at all surprising that we should at last begin to recognize the value of a plant which was five thousand years ago referred to by the father of Chinese Agriculture as the "Honorable Little God." For at least twenty-five thousand years the soybean has been one of the staples in the Far East, ranking with rice as a food product and standing alone in the number of uses to which it could be put. The Japanese were first to recognize the value of the soybean plant as a soil builder and of the meal from the bean as a fertilizer, but the industrial uses to which the products of the plant could be put were first recognized by the laboratories of industry in the United States. Practically all of the industrial development of soybean products has taken place within the last ten years and it has been within the last two years only that real progress has been made. Probably this recent development has been spurred on by a realization on the part of manufacturers that industrial prosperity is almost wholly dependent on agricultural prosperity.

It is believed that soybean seed was first introduced in the United States in 1804, but it was not until more than one hundred years later that any attempt was made to grow them on a commercial scale. It is estimated that there are in excess of two thousand varieties of soybeans grown in the different countries throughout the world today. There is apparently a variety suitable for any type of soil or climate. Many of the named varieties are so similar in appearance and growth that it is impossible to distinguish one from the other, but if they are planted, side by side, the one will produce a satisfactory crop while the other will be almost a total failure. There are probably one hundred different varieties of soybeans being successfully grown on American farms in forty-four of the forty-eight states, but the greater part of the total crop is produced from about twenty varieties. Hundreds of new varieties are now being tested on experimental farms of the Department of Agriculture and on the various experimental farms of the state agricultural colleges. Many of these new varieties

which are now being tested show exceptional promise. Prior to 1917 fewer than 500,000 acres of soybeans were grown in this country and because the crop was grown principally as a legume crop or to replace other crops destroyed by excess rains or drought the acreage fluctuated noticeably until about 1924. Since that time the acreage devoted to soybeans has expanded at a rapid rate and since 1932 it has grown by leaps and bounds. The first attempt made in the United States to extract the oil from soybeans took place at Elizabeth City, North Carolina, in 1913 by a cottonseed crushing plant. This plant was one of the few cottonseed mills of the South to be equipped with expellers similar in type to the expellers which are now in use in the modern soybean plant, yet, their lack of knowledge as to how to handle soybean oil doomed the venture to failure.

In 1919 a second attempt was made to process soybeans, this time the attempt was made by a linseed crusher located at Chicago Heights, Illinois. Once more industry refused to accept soybean oil and feeders and feed manufacturers would use the meal produced only at a discount under cottonseed meal, and so this second attempt was doomed to failure. Within a short time Chemists connected with the Department of Agriculture began to make a study of the composition of soybean oil. A preliminary report of these studies served to create interest among users of vegetable oils. In 1921 a corn processing plant in central Illinois started a soybean processing operation and a fairly satisfactory market was established for the oil produced. A satisfactory market for soybean meal was not established until 1923 when feeding tests conducted by mid-western college experimental stations indicated that soybean meal was in every way equal in feeding value to cottonseed meal. By 1928 the number of soybean processing plants has increased in number to five, three of them being located in Illinois and two in the adjoining state of Indiana. In 1932 the soybean processing plants had increased in number to seventeen and in 1936 to thirty-three. It is estimated that there is in the United States today crushing equipment capable of handling a soybean crop three times the size of the 1936 crop.

The products obtained by the original processors of soybeans are soybean oil and soybean meal. Which of these products is to be considered as the by-product depends entirely on market conditions. In the crop year of 1935, the soybean crushers in the United States produced, in round figures, 600,000 tons of soybean meal and 92,000 tons of soybean oil and it is estimated that in the present crop year the production will be approximately one-third less. Prior to 1930, most of the soybean oil produced was used in the manufacturing of soaps and butter substitutes. The tariff law of 1930 imposed a duty of 3½ cents per pound on imported soybean oil and the Bailey Amendment to the appropriation bill of 1936 not only increased this duty

on soybean oil, but levied additional duties against practically all other imported vegetable oils. These duties on imported vegetable oils have caused domestic users to give more attention to vegetable oils which are available within our own borders. In 1934 ninety per cent of the soybean oil produced in the United States replaced linseed oil, while today at least ninety per cent of the soybean oil being produced is replacing cottonseed or some other oil of a similar nature. This simply means that soybean oil today is being used principally in food products. Tests conducted by Dr. Burlison of the University of Illinois over a period of five years show conclusively that soybean oil can replace up to fifty per cent of the linseed oil used in paints, provided, suitable driers are used. It has not been proved that soybean oil is superior to linseed oil and the paint manufacturers will not use it except in certain products, unless he can cheapen his costs through its use. In 1935, 6500 tons of soybean oil was used in the manufacturing of paints and varnishes. Soybean oil is also used as a core oil in foundries, in the manufacture of printer's ink, linoleum, glycerine, celluloid, rubber substitutes, lubricating oils and waterproof goods.

By far the greater percentage of the soybean oil meal produced is used as livestock feed. In 1935, five hundred and fifty thousand tons of soybean meal from a total of six hundred thousand tons produced was used for the feeding of livestock, either in its original state or as an ingredient of commercial feed. Originally soybean meal was considered as a competitor of cottonseed meal only, but it was soon discovered that it had some of the desirable properties of linseed oil meal. It then became competitive with linseed oil meal. In recent years it has been found that soybean meal plus essential minerals was equal in feeding value to tankage for hogs and within the last two years a bulletin issued by the experimental station of one of the larger agricultural colleges contains the information that the protein from soybean meal can be used to replace one-half the animal protein in a poultry ration with equal feeding results. Soybean meal has been found to have some of the desirable properties of dried milk. In 1936 a Virginia soybean processor shipped almost one-third of their soybean meal production to feed manufacturers who had never before incorporated this ingredient in their feeds. Repeat orders and inquiries would indicate satisfactory results were obtained from its use. The twelve or fifteen per cent of the soybean oil meal produced which is not used for livestock feeding is used in the brewing industry, for human food, for fertilizer, for water paints and in the manufacture of semi-plastics similar to bakelite. Within the last five months we have heard a lot about the possibilities of increased quantities of soybean meal being used in plastic compounds. In this connection it is of interest to know that the Ford Motor Co. has com-

pleted within the last six months a five-million-dollar soybean processing plant in Detroit. The meal produced in this plant will be used in the making of plastics, which in turn, will be shaped into horn buttons, gear shift knobs, window trims and distributor cases. It is also expected that this plant will in time produce larger parts for the Ford car such as window frames, body sections, tops, floor boards and etc. It is reported that during 1936 the products manufactured from 1,200,000 bushels of beans were incorporated in the Ford automobiles produced.

In 1933 agitation was started to have soybeans admitted for cash and futures trading on the Chicago Board of Trade. In 1934 a committee which was appointed to make a study of the situation reported that in their opinion the rules of the exchange should be amended so as to admit soybeans for cash trading only. It was the opinion of the committee that the size of the crop did not yet justify futures trading. In 1935 further agitation was started for futures trading in soybeans. Again a committee was appointed by officials of the Exchange to investigate. Interested parties were given an opportunity to express themselves. Logical reasons were advanced for and against futures trading and in September the committee submitted a report favorable to futures trading. The first futures transaction in soybeans took place on October 5th and consisted of a five thousand bushel May delivery sale at $1.20½. On Saturday, January 9th, May soybeans closed at $1.60½, an advance of 40c per bushel in three months. In the same period of time May corn has advanced 20½c and May wheat has advanced 21⅜c. Whether or not futures trading in soybeans was justified is still a matter for argument but apparently the grower has not been hurt by the first three months transactions.

In closing it might be in order to give a limited word of caution in regard to the possibilities that the soybean holds for agriculture and industry. If we were to believe just one-half of the propaganda which has been written by the professional know-it-alls we would know that the growing of a crop of soybeans would be a happy solution to the farmer's many problems, and we would likewise look to soybean processing as a cure for the ills of industry. Nothing could be farther from the truth. It must be remembered that soybean oil and soybean oil meal are still to be considered as substitutes in the United States for other vegetable products of a similar nature. Fortunately, however, they can both be classed as worthy substitutes. The grower must consider transportation costs from the farm to the processor—he should be in position to accept a quantity of soybean oil meal or feed containing soybean oil meal in part payment for his soybeans for in so doing he will not only improve the market for his crop, but he will also secure a superior feed for his livestock. The processor must have sufficient supplies of soy-

beans available within a reasonable shipping distance from his mill if he is to have an economical and satisfactory operation. In spite of information to the contrary, the community processing plant is not profitable and it never will be. Without a doubt the soybean industry has arrived, but unlimited enthusiasm in regard to its possibilities could lead to over-production with disastrous results to the grower. I have almost unlimited faith in the potential possibilities that the soybean holds for agriculture and industry but we cannot overlook the fact that it is necessary to maintain a balance between production and demand.

SOYBEANS IN MARYLAND ROTATIONS

By J. E. METZER
University of Maryland

The subject of crop rotation enters the picture in Maryland whenever there is a change in the cropping system. Interest in it usually centers about the matter of coverage during the winter months although a planned crop succession has been used for many years for other reasons also. On account of this general adoption of a rotation system of farming in Maryland, only a minimum of cultivated land goes through the winter without protection.

The renewed interest in this subject at this time is due to the development of the soybean for commercial purposes. Maryland has long been a soybean producing state. But the bulk of its crop has been grown for hay and such seed as was matured was reserved for planting purposes. Under these conditions, the acreage involved was not sufficiently large to warrant special care and attention. The crop for most part replaced corn or was used to supplement a hay crop in years when red clover failed. In general it has not been used as a major money crop due perhaps to the fact that the returns per acre have not been especially attractive when compared with other crops that could be produced with greater facility. With the development of commercial uses for the soybean, a new angle presents itself to the growers in eastern and southeastern Maryland. A large plant for the expulsion of the soybean oil is located within easy shipping distance, and the demand for the bean is sufficiently high to warrant growing the crop with reasonable assurance of profit to the grower. The question is how to best fit the crop into the present cropping system without materially disturbing the money income set-up or in any way complicating the soil and soil fertility maintenance factors.

A five-year rotation consisting of corn, wheat two years, and hay and pasture one year each is the prevailing cropping system in the areas most concerned with the production of the oil bean. Several suggestions are offered for bringing the soybean for the mature seed into the crop rotation.

Suggestion No. 1: Corn, wheat or winter barley (with sweet clover and alsike for pasture after harvest), soybean, wheat or winter barley, hay. In this case the land may be kept covered each winter. The pasture is moved to the crop grown between the winter grain plantings.

Suggestion No. 2: This is a three-year rotation. The corn land is divided between beans and corn and the two areas planted to winter grain (either winter barley or winter wheat) and this is followed by one year of mixed hay and pasture.

Suggestion No. 3: This is a four-year rotation. The silage corn area is planted to winter barley. The barley is harvested in June and immediately planted to an early maturing variety of soybeans. The soybean crop is followed by a winter grain, either wheat or winter barley and one year of hay. The remainder of the farm is planted to a rotation of corn, wheat, hay and pasture. This suggestion may be used readily, where tomatoes or sweet corn are grown instead of silage corn. Furthermore, soybeans may follow canning peas. The two crops taking the place of corn or tomatoes.

It should be noted that in each of these suggestions special attention is given to winter coverage for the land. The temptation will be for growers to drop one of the wheat crops and substitute a soybean crop. This will entail exposure of those fields to erosion and leaching during the winter months. Even on fairly flat land sheet erosion is sufficiently serious to cause severe losses. Furthermore, the suggestions contemplate a more intensive cropping program than the old five-year rotation. This suggests that the fertilizer program must be revised sufficiently to meet the added draft on the plant nutrients. Since the soybean draws heavily upon calcium and phosphorus, the soil should be tested frequently for these elements.

In general it is possible to grow soybeans for commercial uses in Maryland without endangering the loss of soil and soil fertility. In as much as winter coverage is the best means of protecting the soils of this state, it is important that it receive first consideration in the planning or revision of any cropping system.

DISCUSSION—MARKETS AND USES OF SOYBEANS IN MARYLAND

By KENNETH W. BAKER, County Agent
Centreville, Md.

I feel the topic for discussion has been thoroughly covered by the previous speakers and want to mention a few of the highlights of the program now under way for the production of soybeans in our county to be used for the extraction of the oil content.

Queen Anne's County is the first county in the state to attempt the commercial production of seed for oil content. This has been made possible through a contract offered by the Allied Mills for oil beans to be shipped to the Portsmouth (Va.) processing plant.

I have the primary interests in this project in the county which are as follows:

1. The addition of another cash crop in the rotation to be used to replace a part of the wheat. Our rotation at the present time is corn, wheat, hay, and pasture. It is our desire to have the corn crop followed by a winter cover crop which may or may not be fertilized. This cover crop is to be plowed under in the spring and, if not fertilized, 0-12-5 or 0-10-10 to be applied prior to seeding the beans. The beans are to be harvested by a combine and followed by wheat.

2. Have the beans harvested with a combine to allow the leaves and vines to remain on the soil as a source of humus and plant food. This method will also insure against large losses due to shattering.

3. The production of a good protein supplement which can be used with home grown grains for mixed feeds. Under the arrangement with the Allied Mills the soybean meal can be returned in exchange for the beans and thereby a rather cheap protein supplement supplied. This will make it possible for a farmer to produce all the necessary ingredients for a properly balanced dairy ration at minimum cost.

At the present time more than 2,000 acres are under contract and it is expected that by planting time approximately 4,000 acres will be used, provided enough seed can be secured.

In closing I would like to introduce Mr. O. C. Jones who is directly responsible for this project.

Discussion from the floor.

PROGRESS IN CLEANING AND TREATING WHEAT AND BARLEY IN MARYLAND

By J. D. McVEAN, County Agent
Chestertown

As Extension workers, our approach is in terms of problems. A main problem in recent years has been insufficient farm income. One means of increasing and insuring farm income is to use high quality seed grains of approved variety; use adequate amount of clean seed; use seed treated to combat the yield and quality reducing disease known as bunt or Stinking Smut.

It is an obvious fact that the small cost of cleaning and treating seed grains is a sound investment or insurance, since such practice has an important influence on an adequate stand and affects yield per acre—quality or grade, or price and therefore income. Our farmers realize the sound economy of this practice and many use it.

In Kent County two large commercial outfits do a big business in cleaning and treating seed grains—one is portable—all equipment being mounted on a truck which goes from farm to farm. The other is stationary but a truck will haul the wheat both ways at no increased cost over that of the portable outfit.

The cleaning process removes practically 100% of corn cockle seed, most of the garlic bulblets, as well as chaff—light grains—cheat, etc. The cleaned seed will, therefore, be more effective in securing an even, adequate stand. Certainly no one can afford to seed cockle or garlic which reduce both yield and grade and therefore income. Copper Carbonate dust or the Mercuric dust sold as "improved Ceresan" will protect clean seed from attack by bunt or Stinking Smut. The latter is probably more economical and more effective and is increasingly popular, since it gives no trouble in drilling.

Considerable interest over the State has been aroused. Inquiries reveal that several more outfits will be in use in 1937. Baltimore County has a good start with such an outfit.

W. H. Carroll, former Assistant County Agent at Towson, reports that Baltimore County is the Maryland County to get a start in this work. He started with a small outfit mounted on a truck this year, but hopes to get a larger one as soon as business warrants it. In spite of the late start, he cleaned and treated 2,581 bushels of grain. An additional 209 bushels were cleaned only.

PASTURE INVESTIGATIONS IN SOUTHERN DELAWARE

By GEO. L. SCHUSTER, Agronomist
University of Delaware

Pasture has been, until very recently, one of our most neglected crops. Many pasture surveys indicate that it is not uncommon to find pastures that require five acres to support one mature animal. Under such conditions the pasture is nothing much more than an exercise lot. Pasture is considered a source of cheap feed and rightly so, because there are not the expenses of harvesting, storing, feeding and removal of manure involved, as they are in the case of barn feeding. However, when a pasture becomes an exercise lot and barn feeding must be resorted to, there is no economy. Pasture plants remove plant food

from the soil the same as any cultivated crop and a program of plant food replacement must be adopted if the life of the pasture is to be insured and the full benefits from it are to be realized.

Some pastures may be improved by the practice of top dressing with fertilizers, manure and lime, others by the use of supplementary pastures. Any method of pasture management that will produce more grazing days for the season that is more economical than barn feeding is desirable. Soil and climatic conditions of Southern Delaware present pasture problems that are different from those that are found in Northern Delaware. These same conditions undoubtedly prevail in some sections of the Eastern Shore of Maryland.

Soil Conditions

The soils of Kent and Sussex Counties, Delaware, contain an average of about 60-100 per cent sand, 20-50 per cent silt, less than 20 per cent clay and 10-20 per cent colloidal material. The soils of New Castle County in Northern Delaware contain less than 50 per cent sand, 30-100 per cent silt, 20 per cent clay and 25-30 per cent colloidal material. The soils of Southern Delaware contain a large percentage of sand and a small percentage of silt, clay and colloids. It has been observed that clays and colloids play an important role in soil productivity, because they hold the plant food in solution in the colloidal jel until the root hairs of the plant are able to take up the plant food and utilize it. Soils of a sandy nature do not have this plant food holding capacity and consequently any excess plant food will be lost by leaching and will pass off in the drainage water.

Climatic Conditions

The normal rainfall for Southern Delaware consists of about three and one-half inches per month for January, February, March, April and May. About five inches for June, July and August, and an average of about three inches for the remainder of the year. However, for the years under observation (1929-31 incl.) the rainfall deviated considerably from normal. The rainfall was exceedingly high from February to May and exceedingly low the remainder of the year.

The average temperature was about 40 degrees F. in January and increased gradually until it reached an average of 80 degrees F. in August and then began a gradual decline. The increase in temperature during the summer months causes an increase in the rate of evaporation during a period when the rainfall does not increase sufficiently to take care of the loss of moisture by evaporation. Likewise the sandy nature of the soil does not present a condition favorable for the holding of water any length of time after rainfall. The water passes off very quickly by leaching and evaporation at a time when a large amount of water is essential.

Investigations

A pasture mixture consisting of timothy 3 pounds, red top 3 pounds, Kentucky blue grass 3 pounds, Canada blue grass 3 pounds, orchard grass 3 pounds, white dutch clover 3 pounds, and brome grass 10 pounds was used as a permanent pasture mixture. This mixture was seeded (28 pounds per acre) in the fall and 8 pounds per acre of Japanese Lespedeza was added in the spring.

Prior to seeding in the fall of 1926, 350 pounds per acre of a 2-10-6 fertilizer was applied. The pasture was again fertilized in the spring of 1928 with 350 pounds of a 2-8-5 fertilizer. Soil tests indicated that there was sufficient lime present. No records were obtained during 1927 and 1928. During this period the pasture was allowed to become thoroughly established. It was divided into several different plots in 1929 and nitrates from several sources were applied at the equivalent rate of 117 pounds of 16% nitrate of soda in the spring of 1929, 1930, 1931, and the fall of 1930. The total amount of plant food applied to these plots from 1926-1931 inclusive was 126 pounds of nitrates, 63 pounds of phosphoric acid and 39 pounds of potash per acre. Another plot called the manure plot received 5 tons of manure per acre in the fall of 1926 plus 350 pounds of 16% superphosphate and the same in the spring of 1928-1929, and the fall of 1930. This plot also received 350 pounds of superphosphate in the spring of 1930 and 1931. The total estimated amount of plant food applied to this plot during the period was 168 pounds of nitrates, 326 pounds of phosphoric acid and 74 pounds of potash.

Results

The pasture consisting of the different treatments was grazed as one field. Frequent clippings were taken and an analysis made as to protein content of the herbage of the variously treated and untreated plots. These observation plots were fenced to prevent grazing and thus obtain a record of plant growth. They were, however, moved several times during the season to a previously grazed section. In this way growth under grazing conditions was approached.

Converting the data obtained into the number of acres pasture required to support a milk producing cow a month, the following table is obtained.

Treatment	Number of Acres Pasture Required to Support One Cow During the Month of:				
	May	June	July	August	September
Untreated	2	3	5½	5½	5½
Nitrogen all sources	1	2½	5	5	5
Manure + Superphosphate	1	2½	4½	4½	4½

The fertilizer treatments have intensified the May and June flush. They have not materially increased the carrying capacity during the latter part of the grazing season. In other words the treatment has given more grazing when it is not needed and not enough when it is needed.

The problem of pasture availability is not one of increased growth, but one of steady growth throughout the growing season. This apparently cannot be accomplished by fertilizer treatments. Soil type and climatic conditions seem to be the limiting factors. The low moisture holding capacity of the soil, insufficient rainfall, and high rate of evaporation due to high summer temperatures, are conditions that fertilizer practices cannot overcome. A mid-summer application of fertilizers might be suggested, but this is not practical. The prevailing climatic conditions make such a practice of uncertain value.

The slightly better distribution of grazing on the manure-superphosphate plot suggests that the incorporation of organic matter will improve grazing conditions. The addition of organic matter will increase the moisture holding capacity of the soil as well as supply some plant food. The author does not mean to suggest that permanent pastures grown under similar conditions should not be fertilized. They should be fertilized—but with the idea of insuring the life of the pasture, and not with the idea of distributing the grazing throughout the season.

Other Observations

The spring application of fertilizers will probably advance the grazing date a week to ten days in the spring; intensify the spring flush and then go into a semi-dormant stage much the same as untreated pasture, and revive somewhat in the fall. The problem then becomes one of supplying pasture during the period of semi-dormancy of the permanent pasture. One of the ways of accomplishing this is by the use of sudan grass.

Sudan grass may be seeded the first of June (rate 30 pounds per acre) and under good average conditions will be ready for grazing a month later. Data secured in Southern Delaware showed that 10 acres of sudan grass carried 18 head of cattle for 25 days in July, 26 days in August and September and 6 days in October. Using the June milk production record of the herd as a base, the July milk record increased 13.4 per cent, decreased 3.2 per cent in August and 7.3 per cent in September. While there was a slight decrease in milk production in August and September when compared with June of that year, the milk production for these two months was above the average of the same period for previous years.

Conclusions

1. Increase the organic matter content of light sandy soils where permanent pasture is desired.

2. Follow fertilizer, and manure practices that will insure the life of the pasture.

3. Lime when necessary.

4. Resort to supplementary summer pasture to supply grazing during the semi-dormant stage of the permanent pasture.

5. A satisfactory supplementary pasture may be secured with sudan grass.

PASTURE PROBLEMS OF WESTERN AND NORTHERN MARYLAND

By FRED V. GRAU, Extension Agronomist
The Pennsylvania State College

Improvement by Fertilization

Why Improve Pastures

It is of less importance at this time to outline reasons for improving pastures in Northern and Western Maryland than it is to discuss the underlying causes of pasture impoverishment and to suggest a remedy. In a few words, however, I wish to preface my discussion of pasture problems with a brief resumé of some of the oft-repeated advantages to be gained by taking particular care of the most valuable field on the livestock farm—the permanent pasture.

In this day of economic recovery, perhaps the most significant argument in favor of improved methods of grassland farming is that of low-cost production of nutritions and easily-digestibe feed. O. C. Reed, Chief of the U. S. Bureau of Dairy Industry at Michigan State College, gives to us these highly informative figures which represent all the available data from sixteen experiment stations, averaged and grouped in order of their cost of production.

Cost of growing 100 pounds of total digestible nutrients.
Average of figures from 16 States.

Crop	Pounds per Acre	Cost per 100 lbs. T.D.N.
Oats	932	$2.02
Wheat	1146	1.88
Barley	1217	1.70
Corn silage	2320	1.54
Corn grain	1778	1.38
Timothy hay	1257	1.21
Mixed clover and timothy	1347	1.15
Soybean hay	1725	1.06
Red clover hay	1622	.97
Alfalfa	2522	.83
Pasturage		.64

These figures alone should serve to convert all stockmen into ardent pasture enthusiasts, if only from the monetary standpoint. The chief reason for the low cost of producing feed as pasture herbage is that the yearly expenditure for seed, labor and equipment is so ridiculously low. Once established and properly managed, a pasture is a permanent fixture because the chief pasture plants of our region are perennial and need not seed in order to reproduce themselves. Grain crops require reseeding annually, a heavy equipment investment, and time and labor in tilling and harvesting.

For the dairyman who thinks in terms of milk quality, ample green feeds are always available to his herd. The vitamin A content of green feeds, so necessary for the health of babies and growing children, is present in relatively large quantities in pasture herbage, rich in carotene. Bright alfalfa hay, the running mate of good pastures, is likewise rich in this essential health element.

Further, good pasture sods are invaluable in avoiding soil losses by erosion. Animal diseases are lessened by avoiding close contact with the soil and through increasing the resistance of animals to disease by better nutrition. Soil organic matter and fertility are built up by the increased root systems of grasses and legumes. Low-producing acres are converted from taxable liabilities into profitable investments.

Exploitation Reduces Production

A grazing animal removes from the pasture field a definite quantity of mineral elements which have been absorbed from the soil by the growing plants each time it takes a mouthful. Only a small portion of this fertility is returned to the soil in the droppings,—the rest is converted into milk or mutton, beef or butter. An average figure for the acre-season production of dry feed on good pasture is about 3000 pounds of 15 to 20 per cent protein content in which is removed approximately 40 pounds of lime, 20 pounds of phosphoric acid, considerable potash. When grazed year after year with no return of the elements removed, production becomes less and the quality of the feed drops. Yields of 300 to 400 pounds of dry feed an acre on unfertilized pasture are common. Protein drops to low levels, palatability and digestibility decline. The mineral content of the herbage (Ca and P) often becomes so low that mineral supplements are necessary to prevent serious bone disorders, non-contagious abortion, and associated nutrient-deficiency diseases. Grazing animals must forage further to obtain sufficient nourishment to maintain weight and production drops due to energy expended in unnecessary exercise—the profits are taken out of the milk pail.

J. B. Orr in "Minerals in Pasture" presents analyses of forage

from pastures on which mineral-deficiency diseases have been reported. The phosphorus content ranges from 0.19 to 0.30 per cent, the calcium oxide content from 0.21 to 0.49 per cent. Pierre, West Virginia, reports figures from unfertilized bluegrass sods from 0.16 to 0.25 per cent, for phosphorus; 0.30 to 0.37 per cent for calcium, and even lower figures for broom sedge and poverty grass. At Kylertown, Pennsylvania, analyses of clippings from well-fertilized pasture revealed a content of over 1.0 per cent of calcium oxide and 0.6-0.7 per cent of phosphoric acid. Clearly, these figures emphasize that the mineral content of pasture herbage is a factor to be seriously considered in maintaining health and vigor of producing animals. Our pocket books demand that yields be considered.

What is Needed to Restore Production

The major portion of Northern and Western Maryland's better pastures are found in the limestone valleys and on the more fertile soils of the Piedmont and the Blue Ridge. Kentucky bluegrass and native white clover predominate where the fertility is high but are replaced by such weeds as broom sedge, poverty grass, sweet vernal grass, ragweed, goldenrod, and cinquefoil when the level of fertility becomes too low to support the more desirable species. In the Plateau section, the steep slopes are less fertile and one finds more bent grass than bluegrass and clover, even though both will thrive under proper care and management. Poverty grass, moss, laurel, and bracken ferns soon occupy neglected pastures.

The following figures taken from data reported in Maryland Bulletin 373 substantiate the well-known fact that bluegrass prefers a sweet fertile soil and gives us the real clue to the solution of the problems of pasture improvement in the greater part of Maryland.

Soil Tests and Vegetation on Maryland Pastures

	Limestone	Piedmont	Coastal Plain	Plateaus and Ridges
Lime Requirement	220	800	1460	3300
Aluminum (soluble)	3.5	5.0	5.7	7.5
Calcium	5.1	4.1	4.0	2.6
Phosphorus	4.1	3.7	3.7	2.6
Bluegrass and clover	70.0	47.0	36.0	8.0
Weeds	16.0	20.0	35.0	51.0
Pasture Quality	80	70	54	36

Of greatest significance in this group of figures is the close association between the preponderance of bluegrass and clover, the relatively high content of calcium and phosphorus in the soil, and the low lime requirement and low soluble aluminum content, most strik-

ing in the limestone soils. The Western Maryland pasture soils, on the other hand, support a scant growth of bluegrass and clover and exhibit low values for calcium and phosphorus, high values for lime requirement and soluble aluminum. These data would strongly indicate that in these sections acid soils low in fertility produce poor pastures. Let us see how that holds for the state as a whole.

Relation of Acidity to Pasture Quality

Acidity (degree)	Poor	Fair	Good	Excellent
Very acid	19.5	4.5	0.5	0.5
Medium acid	32.0	46.0	30.0	12.5
Slightly acid	48.5	46.0	63.5	68.0
Neutral	0.0	3.5	6.0	19.0

The effect of acidity on pasture quality, as measured by the occurrence and vigor of bluegrass and clover, is here clearly shown. Poor pastures are predominantly acid, excellent pastures slightly acid to neutral. The following figures for soluble aluminum substantiate these for acidity.

Relation of Soluble Aluminum to Pasture Quality

Test Reading	Poor	Fair	Good	Excellent
Low	1.5	1.0	6.5	14.0
Medium	5.0	25.0	41.5	51.5
High	93.5	74.0	52.0	34.5

Over 93 per cent of all "poor" pastures in Maryland tested High for aluminum; over 65 per cent of the "excellent" pastures tested Medium to Low, clearly indicating the association of the high acidity, high soluble aluminum, and low pasture quality.

In our cropping practices we recognize the value of lime for reducing soil acidity and improving it for growing crops, rendering nutrient minerals more available to growing plants and for increasing desirable bacterial activity. The additional use of manure and phosphatic fertilizers is an established practice which needs no discussion here. Abundant evidence is available to demonstrate that the same materials applied to pasture lands produce even more striking results. What is the status of pasture improvement at the present time and what are the results from the application of the various materials alone and in combination?

How Maryland Pastures Respond to Treatment

Of those pastures receiving treatment, manure alone is the most widely used. Manure by itself does little to improve pasture sods but when accompanied by lime there is a marked improvement. When

fertilizers are used in addition the results are striking. The following figures for the state as a whole reveal the truth of these statements.

Pasture Quality as Affected by Treatment

	Poor	Fair	Good	Excellent
No treatment (39)	25	33	27	15
Manure only (26)	4	25	34	37
Manure and lime (18)	3	3	38	56
Manure, lime, and fertilizer (9)	3	6	19	72

Just why the field which is capable of producing the greatest returns per dollar invested has been so sadly neglected and so poorly treated is not entirely clear. Many believe that the droppings are sufficient to maintain fertility, a thought which common sense reasoning will tell us is untrue. Others believe that a pasture just naturally "runs out" after a few years and must then be plowed, put through a rotation, and seeded back to pasture, an unnecessary and expensive practice. A decline in the soil fertility level is the reason for the poor condition.

The soils of northern and western Maryland are potentially fertile and respond to treatment. Specifically, the first essential in most cases is lime, and this is particularly true on pastures. If the soil test indicates that, for example, 2½ tons of limestone or its equivalent is needed to neutralize the acidity, it is not necessary to apply the full amount at one time. Lime requirement is figured for a depth of 6⅔ inches and indicates the amount needed to neutralize the acidity in one acre of soil, 6⅔ inches deep. Lime applied on the surface does not penetrate deeply,—not over two inches in most cases; hence, the amount needed to thoroughly sweeten those two inches is actually only about one-third of the total amount indicated by the test. In Pennsylvania, we have obtained satisfactory results in many cases with only one ton to the acre even on soils needing 3 to 4 tons to the acre to neutralize the acidity to plow depth.

Phosphorus is the second limiting element in pasture production and nearly all of our eastern soils require an abundant supply of this element to produce satisfactory growth. Its effect is to increase the depth, spread, and vigor of root systems, encourage clover, build up the nutritional value of the herbage and improve the health and vigor of the grazing animals. We realize why manure alone on pasture produces only mediocre results when we analyze barnyard manure and find that the phosphorus content is only half that of the nitrogen and potash. Were superphosphate to be added to the manure

before it was spread on pastures the results would be greater by far. Acid soils are not responsive to fertilizers alone because the soluble iron and aluminum present form insoluble compounds and render them relatively unavailable to the plants. The use of lime prior to applying manure and fertilizer prevents this loss since the lime renders the "robber" elements inactive, thus making the fertilizer more usable to the plant.

The value of periodic applications of fertilizers is found in the data reported by Vinall and Wilkins on experiments conducted at Beltsville. Where they applied nitrogen to bluegrass sod, the clippings analyzed over 12 per cent more protein than the unfertilized grass. But, on white clover, nitrogen yielded no increase of protein and actually depressed the amount of calcium in the herbage. The use of phosphorus, however, caused a uniform increase of minerals in both bluegrass and clover. The phosphorus content of bluegrass was raised over 25 per cent; of white clover over 22 per cent. The calcium content increase was nearly 17 and 12 per cent, respectively. Johnstone-Wallace reports similar results, all of which point out that for our pastures, superphosphate is the most effective and the cheapest fertilizer that we can use.

The details of pasture improvement are well-known to your Agronomy Specialist and to your County Agents who are available to help you with your problems. Treatment will differ slightly due to location, soil type, and farming practice. We are all in complete agreement, however, that pastures must be limed and fertilized in order to maintain production and that, when well treated and well managed, they will continue to produce indefinitely without cultivation or reseeding.

In Pennsylvania we are getting the best results with heavier initial applications of superphosphate—around 500-600 pounds to the acre—repeated every 3 to 4 years. Where the sod is thin and weedy, manure is used at the rate of 8 to 10 loads to the acre which gives the grasses and clovers a start. Very little nitrogen is used because white clover is natural as it is in Maryland and, with proper management, the clover furnishes large amounts of nitrogen to the grasses.

Improvement by Management

Factors of Pasture Management

Equally as important as liming and fertilizing is the question of properly managing the pasture in order to obtain the best results. Soil treatments will encourage the grasses and legumes to grow and to produce more heavily, but good management is necessary to prevent a large part of the increased production from being lost.

Seasonal production is one of the most difficult problems which we have to solve in the management of our pastures. Early spring produces a lush growth which, if not grazed soon enough or hard enough, soon gets too big and coarse and is refused by the animals which prefer the more tender actively-growing grass. To turn out too soon may harm the sod if the soil is wet and soft and is easily cut by the feet of the animals. To wait until the bluegrass starts to head out, as many do, causes much of the feed to be trampled and wasted and lowers feeding value and palatability. The highest protein content is found in frequently clipped, actively-growing vegetative growth of grasses and legumes; hence, it is desirable to stock the pasture heavily enough so that the herbage is maintained in that stage of growth. On good pasture this may require as high as two animal units to the acre during the lush period and about one when growth is slower. The most desirable time to begin grazing is when the pasturage is from 3 to 4 inches high. This is the height at which a cow can graze most efficiently.

Summer drought periods cause a drop in pasture production which at present cannot be taken care of by either fertilization or management of bluegrass-clover pastures. During times of drought the bluegrass enters a state of dormancy which is broken only by restoration of sufficient moisture for good growth. Clover ceases to grow and cattle begin searching for food elsewhere. Milk flow declines unless there is an abundant supply of green feed. The best bridge which we have for this gap at the present time is emergency pasture and soiling crops which consist of heat-enduring drought resistant crops. Chief among these are sweet clover, alfalfa, Sudan grass, soybeans, millet, and sorghum. Sweet clover is usually pastured since it makes only a poor grade of hay. Alfalfa may be pastured after the first cutting but if grazed heavily the stand may not last long. Orchard grass with alfalfa has been pastured for several years in succession with excellent results in many places in southern Pennsylvania. Sudan grass will often carry three head to an acre from July 15 to early in September. Soybeans make the best green feed high in palatability and protein content. In combination with Sudan grass it makes excellent summer pasture. Millet and sorghum are less popular than the others but can be profitably used.

We have many farmers in southern Pennsylvania who set aside a small plowable field for the purpose of providing pasture to fill in the gaps. Rye or rye and vetch is seeded in early fall and is pastured in the late fall after the cattle have been removed from the permanent pasture. It is again grazed in the early spring until the bluegrass pasture is ready. Then it is plowed and fertilized and seeded to soybeans and Sudan grass for summer grazing, and the process repeated in the fall.

During an open winter it is a common sight to find herds grazing as late as New Year's Day, picking the grass so closely that there is no top growth left for winter protection. This is definitely a mistake. Grasses and legumens fare better when permitted a 3 to 4 inch growth in the fall for protection during the winter months. The next season's growth is more vigorous and more drought resistant by virtue of the more extensive root system and the greater reserves of food supplies.

A factor of pasture management which is widely known but little appreciated is the fact that our northeastern states were once wholly covered by hardwood forests and, given the opportunity, will soon revert to forest again. This succession of plants may be found in almost any stage of development in our Northern and Western Maryland pastures and surrounding territory. Briefly, the story is this:

The forests, over long periods of time, have built up the organic matter content of the surface soils with their leaves, twigs, and debris which carry the elements of fertility. When cut over, grass and clover spring up and furnish good grazing for a period of years, the stored-up fertility of the forest mull encouraging a good growth of nutritious feed. Were the original fertility maintained by periodic applications of lime and fertilizer, the forest could never regain a foothold because the grazing animals would nip the young shoots in their stride. But, that factor is neglected and the grass becomes thin and poor and the cattle graze less closely due to the moss and weeds which have been able to gain a foothold. Patches of bracken fern appears, thornbushes and laurel spring up and are undisturbed by mowing or grazing. In these protected spots the more permanent shrubs and trees gain a foothold and within a generation or two the cleared field is on its way back to forest.

To prevent this at least two things are necessary; first to maintain fertility, and, second, to run a mower over the pasture twice a year to discourage all shrubby and weedy growth. Fertilizing alone will not prevent tree growth—mowing will. It is so simple an operation in most cases and yet so little practiced. Two clippings a year suffice to prevent most weeds from maturing seeds and, at the same time, discourage shrub and tree growth. In addition, any ungrazed spots which have headed out and become tough and unpalatable, are stimulated to renew vegetative growth thus encouraging closer grazing and better utilization of the entire pasture area.

A common fault of pasture management, most noticeable in some of the limestone pastures, is that of allowing the bluegrass to become too big and heavy, either through lack of mowing or under-

grazing. This practice discourages the white clover by smothering it and thus reduces the feeding value and the protein content of the herbage. White clover thrives best under closely grazed conditions.

In summary, the chief pasture problems of Northern and Western Maryland are:

Determine by soil test the need for lime and, if the lime requirement is over one ton to the acre, apply that amount as a minimum single application.

Apply superphosphate every 3 to 4 years.

Scatter manure in fall or winter where pasture sod is thin and weedy or where it is inclined to be sandy.

Start grazing when herbage is 3 to 4 inches high and discontinue grazing in fall to allow about the same amount of growth before winter.

Graze closely but not continuously to encourage white clover—alternate grazing encourages more uniform grazing.

Clip the pasture field twice a year (June and August) wherever possible.

Provide emergency pasture for summer drought periods.

HYBRID CORN—THE PRESENT SITUATION AND THE RESULTS OF TRIALS.

By R. G. ROTHGEB
University of Maryland.

Some of you are well acquainted with hybrid corn, while others, no doubt, have only a hazy notion about it. In order that we may start on an equal footing I shall attempt a brief explanation before discussing trial results.

The Meaning of "Hybrid"

A hybrid is what some people call a cross. The word has long been a common term in plant and animal breeding. In the most general sense, it is applied to the offspring of parents which differ in hereditary behavior. The differences may be great or small. However, in practice we are inclined to think of hybrids as resulting from crossing parents which differ rather widely in one or more visible characters such as size, shape, color, etc. The mule is often an over-worked animal—both as a beast of burden by the plowman in the field, as well as an example of an animal hybrid by the professor in the classroom. Its parents are so different that even the city-bred child has little trouble telling them apart. Although, this hybrid, because of its toughness and vigor, is highly regarded for some types of work, it is of no value for breeding purposes. The

mixing of blood as different as that of the horse and that of the ass results in sterility of the progeny.

Less extreme is the effect of crossing more closely related animals or plants. Crossing breeds of horses or varieties of corn produces hybrids which are capable of producing offspring. The first generation of such a union may or may not have a utility value. However, little dependence can be placed in the ability of a first generation hybrid to transmit its good qualities to the next generation.

Hybrids may be good, bad, or indifferent. The word hybrid included in the name of a corn does not guarantee superiority. Each hybrid has to stand on its own merits as is the case with an ordinary variety. Mispronouncing "hybrid" by calling it "high-bred," not only constitutes a literary error, but also gives an exaggerated meaning to the term.

Modern Corn Hybridization

More details are known about the heredity of corn than any other farm crop. This knowledge started to pile up at the beginning of the present century, and continues to do so at an increasing rate. Today the inheritance of three hundred and fifty characters can be predicted on a mathematical basis. Much remains to be known, but facts at hand have shaped the program for practical corn improvement. This program is complicated and time-consuming. It largely relies on the principle of hybridization.

The practice of crossing plants differing in certain characteristics in order to obtain a new individual with the desired combination of characters, of course, is not new. The popular Reid Yellow Dent variety of corn originally resulted from such a cross. But the attempt to utilize the increased vigor and uniformity which occurs in the first generation of some crosses is of more recent date. Today corn breeders are occupied in discovering, first, what corn crosses show hybrid vigor in the first generation and at the same time possess the type of ear and stalk desired by farmers, and second, how seed production of good hybrids can be organized to reduce the present high cost of hybrid seed.

The direct crossing of established varieties with the idea of using the first generation as a field crop has been disappointing. Corn being a naturally cross pollinated plant, all of our varieties are more or less mixed with regard to heredity. Any farmer knows that he can pick out a great number of different plants and ears from the same field planted to one variety. He can find late plants, early plants, tall plants and very short plants, ears with many kernel rows and ears with a very few kernel rows. He may even find a few red ears, when, of course, he knows that he planted no red seed.

Owing to this mixed condition in varieties, they produce only mixed offspring when crossed.

In order to make the greatest gains from crossing it has been found best to start with parents which are pure or almost pure with regard to hereditary make-up. Such purification can be effected by intensive inbreeding of our varieties for several generations. As a result of this man-controlled inbreeding of a mixed variety, a number of the so-called inbred lines are finally obtained. These lines are pure because they are capable of producing offspring of uniform appearance. Although inbreeding brings about uniformity, it results in a great loss of vigor. No inbred lines are as productive as the variety from which they were obtained. In fact many of them are lost because of their weaknesses. However, those lines which survive, and are crossed, produce an exceptionally vigorous first generation of uniform plants. These first generations are always far more productive than their inbred parents and in some cases they definitely exceed established varieties. The latter are the hybrids for which the corn breeder is looking. Unfortunately, only a few inbreds make really superior commercial hybrids, and at the same time are sufficiently vigorous to be carried from year to year as breeding stock. Hundreds of inbred lines have been isolated in order to uncover the few that have been used to form accepted hybrids.

Briefly, the steps in turning out a good corn hybrid are as follows:

1. Inbreeding established varieties for four or more generations in order to produce inbred lines of hereditary purity to be used as breeding stock.
2. Crossing inbred lines to form first generation hybrids.
3. Testing first generation hybrids in the field for at least three seasons.
4. Organization for carrying necessary inbred lines and producing crossed each year in quantity for farm use.

Thus it will be seen that the present-day program is rather complicated, requires skill and technical knowledge, and is time-consuming. If a breeder starts from scratch eight years is about the shortest time in which he can hope to develop a commercial hybrid. Furthermore, the production of hybrid seed from year to year once a desirable cross has been made, is by no means an easy undertaking. Careful handling of breeding blocks must be maintained to prevent undesired crossing.

Types of Hybrids from Inbred Lines

Some confusion exists concerning the kinds of hybrids obtained by the use of inbred lines. In the literature the reader is apt to run into such terms as single cross, double cross, three-way cross, and top cross. Although the farmer need not know the difference among these hybrids if he buys on known performance, such information may be helpful if he is buying unknown stock.

The single cross is the first generation resulting from the crossing of two inbred lines. Of all types of hybrids it is the most uniform and gives the greatest increase in vigor. It has the disadvantage in that the seed which the farmer plants is produced on a weak inbred parent, and, therefore, is usually of small size and irregular shape. Although single cross seed may be of poor appearance it usually germinates well and produces vigorous plants. Unless attention is given to planter adjustments an irregular stand is likely to occur.

The double cross is probably the most usual type of hybrid. It is simply the first generation cross between two single crosses. It, therefore, requires four inbred lines instead of two. In this case the seed which the farmer buys is produced on vigorous plants and therefore is of normal size and shape. Although its appearance is much better than that of the single cross, it produces no better crop than the latter.

The triple cross is the first generation between a single cross and a third inbred line used as the male parent. It also gives seed of good appearance.

The top cross is the first generation between an ordinary variety used as the female parent and an inbred line. It provides seed of good appearance, and is least expensive of hybrids to produce as only one inbred line is required. However, its increase in vigor and uniformity is not as marked as in the preceding types.

Regardless of the kind of hybrid, crossed seed must be planted for each crop, for the first generation of plants is the only one that shows superiority.

Production and Performance of Hybrid Corn

According to a report in the United States Department of Agriculture Yearbook for 1936, the first hybrid corn seed from inbred lines was sold in 1922 in Connecticut. Since the organization in 1926 of the first seed company for the commercial production of hybrid corn, new concerns have been added to the list each year. According to the above report at least 44 hybrids have been released from 12 experiment stations. To this amount must be added a smaller but in-

definite number produced by individuals and seed companies. Practically all hybrids now in use were distributed in the last five years.

It seems reasonable to estimate that in 1936 not more than 1 per cent of the total field corn acreage in the United States was planted to hybrids. In no state was the percentage above 4 per cent. Thus we see that at present the use of hybrid seed is not extensive. There is every indication, however, that production will increase rapidly in the next few years.

Most of the hybrids so far released were developed in the Corn Belt of the Mid-West. Therefore, few of them can be expected to be at their best in Maryland. When compared with local varieties at the station where they were developed most of the released hybrids have given 10 to 20 per cent greater yields. Also, as a rule they have shown greater resistance to lodging and diseases, have had fewer barren stalks, and have shown greater uniformity from plant to plant than ordinary varieties. It is well to remember that these hybrids were released because they proved to be superior, and that numerous other hybrids in the same tests fell by the wayside.

Results of Tests at College Park

Due to the scarcity of hybrid seed, even for trial purposes, tests at College Park did not start until 1935. In that year five early hybrids from the mid-west were included. Under conditions which produced a crop well below average for the land used for the trial plots, two of these hybrids outyielded the Golden Queen check by a slight margin. The other three were less productive.

In 1936 the same hybrids used in 1935 were included with fifteen others from various surces. They were put in the same plot tests with such standard varieties as Reid Yellow Dent, Johnson County White, Golden Queen, and Lancaster Sure Crop. Due to an exceptionally favorable season, yields were far above the 50-bushel average obtained for this location in normal years. The quality of the crop was excellent, for there were very few nubbins and almost no moldy ears. Due to rainfall distribution late kinds had a slight advantage over early ones.

In the 1936 test the largest yield for an ordinary variety was 79.3 bushels per acre of air-dry shelled corn, a yield made by a Maryland strain of Reid Yellow Dent. Five hybrids beat this figure. The largest yield, 93.2 bushels per acre, was made by a hybrid from Missouri. This represents a gain of about 17.5 per cent over the best variety.

Five strains of Reid Yellow Dent were included in the trials and gave an average yield of 73.8 bushels per acre. In comparison with

this figure the twenty hybrids in the test performed as follows: eleven hybrids averaged 81.2 bushels or 7.4 bushels (10 per cent) better than the Reid class; six were 5 bushels under the latter; and the remaining 4 were close to the Reid figure.

Most of the hybrids showed distinctly less lodging than Golden Queen, the check variety which occupied every fifth plot position throughout the trial area. As to number of barren plants there seemed to be little difference between the varieties and hybrids. Perhaps in a less favorable year this comparison would have been more marked.

There was a definite tendency for the more productive hybrids to bear more than one ear per plant. And in most cases the ears were considerably smoother and more slender than the show type of Reid Yellow Dent.

Conclusions

Hybrids have not been tried in Maryland extensively enough to afford a basis for definite recommendations. There is evidence that some of the hybrids already produced in the southern border of the corn belt will perform satisfactorily in Maryland. However, seed is quite scarce and high in price ($5 to $10 per bushel) and unless there is strong assurance that a hybrid will be ten to fifteen per cent more productive than native stock, I doubt whether it will prove a worthy substitute.

The extensive use of corn hybrids seems to be a thing of the near future. Corn Belt experiment stations and seed companies are in the final stages of hybrid seed production. By the time this seed is available in quantity, the Maryland Station will have more adequate trial results for the making of recommendations.

In the meantime, those curious souls who must try new things before they become old, and who are fortunate enough to find sources of seed, had best invest on a small scale, and with the understanding that disappointment is at least a possibility.

REPORT OF THE SECRETARY-TREASURER FOR THE YEAR 1936

The State Corn Show, now being held at this hotel, is probably the largest and most attractive that has been sponsored by the Society. The quality averages unusually high. This is further shown by the fact that some of the entries won a second, a fifth, and an eleventh place at the International Grain and Hay Show at Chicago, last month, and others won high places in the Interstate Classes of the neighboring states.

Following is the number of entries in each class, the number of prizes given, and the names of the first four winners.

STATE CORN SHOW

Class I Reids Yellow Dent	29 entries	15 prizes offered
Class II Golden Queen	23 entries	15 prizes offered
Class III Sure Crop	10 entries	10 prizes offered
Class IV Other Yellow Dent	11 entries	10 prizes offered
Class V White Cap	9 entries	9 prizes offered
Class VI Johnson County White	20 entries	15 prizes offered
Class VII Maryland 30 Ear Seed Growers Display	15 entries	15 prizes offered
Class VIII Interstate Class		5 prizes and Trophy

This makes a total of 108 entries as compared to 92 entries last year.

T. Wilson Galbreath, of Street, was named winner of the Maryland trophy for the best ten ear exhibit of corn and Grand Sweepstakes winner this year in the annual Maryland Corn Show held in Baltimore during the meetings of the Farm Bureau Federation.

Others who were awarded places in the contest were as follows:

Class One—Reids Yellow Dent—First, T. W. Galbreath, Street; second Jacob Burtner, Boonsboro; third, T. E. Zimmerman, Frederick; fourth, Maynard Hawker, Middletown.

Class Two—Golden Queen—First, Mrs. Granville Arbaugh; second, Mrs. Walter Warehime; third, Walter Warehime, all of Westminster; fourth, Cecil K. Holter, Jefferson.

Class Three—Sure Crop, Early Clarage and Similar Types—First, Ida Warehime; second, Eleanore E. Galt; third, Mrs. Walter Warehime; fourth, Walter Warehime, all of Westminster.

Class Four—Other Yellow Corn—First, Louis Burtner, Keedysville; second, Walter Turner, Church Hill; third, Clark Crawford, Keedysville; fourth, Robert Holter, Jefferson.

Class Five—White Cap and Similar Types—First, Roger Burtner, Keedysville, Edwin Burtner, Keedysville; third, John E. Crum, Walkersville; fourth, Walden Burtner, Boonsboro.

Class Six—Johnson or Boone County White and Similar Types—First, M. C. Zimmerman; second, B. F. Zimmerman; third, T. E. Zimmerman; fourth, Richard Zimmerman, all of Frederick.

Class Seven—Maryland Seed Growers' Display—First, John Tarbert, Glencoe; second, Walter Warehime, Westminster; third, Cecil K. Holter, Jefferson; fourth, T. E. Zimmerman, Frederick.

Class Eight—Interstate—First, T. Wilson Galbreath, Street; second,

Mrs. Granville Arbaugh, Westminster; third, Jacob Burtner, Boonsboro; fourth, M. C. Zimmerman, Frederick.

The corn was judged by Professor Geary F. Eppley and Doctor Russell G. Rothgeb, both of the University of Maryland.

At the business session at the close of the meeting on Thursday, the following officers were elected for the ensuing year:

President—Maynard Hawker, Frederick, Maryland.
Vice-President—Fred C. Jones, Darlington, Maryland.
Secretary-Treasurer—F. W. Oldenburg, College Park, Maryland.

TREASURER'S REPORT

Maryland Crop Improvement Association
January 1, 1936, to December 31, 1936

Receipts

Book balance January 1, 1936	$74.29
Appropriation from Agricultural Society	176.50
Dues paid by members (1936)	9.00
Dues paid by members (1937)	1.00
Dues taken out of awards	34.00
Total Receipts	$294.79

Expenditures

Maryland Farm Bureau dues	$20.00
Trophy	20.00
Awards	116.00
W. R. Ballard, awards for Potato Show	37.50
Dues taken out of awards	34.00
Stamps	4.65
Cash in Bank, December 31, 1936	62.64
Total Expenditures	$294.79

Baltimore, Maryland, January, 1937.

We, the undersigned, have examined the books of the Treasurer of the Maryland Crop Improvement Association and have found them to be correct.

Auditing Committee,

H. M. CARROLL.

REPORT

OF THE

TWENTY-EIGHTH ANNUAL MEETING

OF THE

Maryland State Beekeepers' Association

January 13, 1937

Lord Baltimore Hotel

Baltimore, Maryland

The Twenty-Eighth Annual Meeting of the Maryland State Beekeepers' Association was held Wednesday evening, January 13, 1937, at the Lord Baltimore Hotel, Baltimore. This meeting was held in conjunction with the meetings of the Maryland Agricultural Society—Maryland Farm Bureau Federation.

Dr. S. R. Damon, Towson, called the meeting to order at 7:25 and delivered the annual presidential address in which he reviewed the activities of the Association for the previous year.

Dr. Ernest N. Cory, Secretary-Treasurer, read the minutes of the last meeting and submitted the yearly financial report, both of which were approved.

Dr. Damon called on George J. Abrams to give a report of his trip to the International Beekeepers' Convention. Mr. Abrams responded by telling briefly of the convention activities and outlining plans for the 1937 convention, which will be held in Washington, D. C., on October 25, 26 and 27, 1937.

Mr. Abrams reported the recent death of Mr. William Boarman, who had been engaged in making an economic study of the Maryland beekeeping industry. It was decided to present Mr. Boarman's progress report at the next meeting of the Association.

Mr. A. D. Hiett of the G. B. Lewis Company was called on for a few remarks and responded by describing the work being done by the American Honey Institute. Mr. Hiett appealed to the membership to support the Institute in the fine work it is doing.

There followed a very interesting address by Dr. L. M. Bertholf, of Western Maryland College, in which he described the reactions of honeybees to color and light intensities.

Following Dr. Bertholf's talk, Mr. James I. Hambleton, Director of the U. S. Bee Culture Laboratory, was called on to say a few words. Mr. Hambleton urged the Maryland beekeepers to add their support to the success of the coming Beekeepers' Convention.

There followed the presentation of a very interesting paper by Mr. R. E. Lathrop of the U. S. D. A. Bureau of Chemistry and Soils, entitled "Ability of Honey to Absorb and Retain Moisture, and Practical Applications to Promote Greater Use of Honey." Considerable discussion followed this talk regarding possible new uses for honey.

Mr. Harold L. Clay, of the U. S. D. A. Bureau of Agricultural Economics, gave a most interesting picture of the present status of the honey market in a paper entitled "The National Honey Market," which was followed by a number of questions from the floor.

The next meeting, for the election of officers and to formulate plans for the Association's part in the International Beekeeping Conference, was scheduled for February, the exact date to be decided by the Secretary.

Meeting adjourned at 10:30 P. M.

FINANCIAL STATEMENT

January 13, 1937

Balance on hand, January 13, 1936		$29.89
Receipts—dues and subscriptions (28 paid up memberships)		$31.50
Expenditures—		
Subscriptions	$ 6.00	
Expenses for Geo. Harrison to meeting	8.10	
Muslin for fair	2.40*	
Tips at meeting	.50*	
	$17.00	
		$44.39**

*Cash paid out by Mr. Abrams.

**Cash on hand $17.10.

Outstanding: Payment to Farm Bureau Federation for annual dues, $20.00.

REPORT OF EXTENSION ACTIVITIES IN APICULTURE FOR 1936

By GEORGE J. ABRAMS
Specialist in Apiculture

Introduction

In the Educational Work with the Beekeepers it is felt that real success was obtained, particularly with regard to the colony and apiary management problem, the requeening campaign, the beginners' school and the keeping of records and accounts by beekeepers.

Signal success was experienced also in the Honey Marketing and Publicity branch of the work and important work has been started (October, 1936) in cooperation with the Department of Agricultural Economics of the University of Maryland, in surveying the Maryland honey markets and in making an economic study of the Maryland beekeeping industry.

A particular effort was made to increase the scope of Extension Apiculture in the state with regard to individuals receiving help. Many new personal contacts were made in the apiary, in addition to the new contacts made at meetings and by correspondence.

Educational Work with the Beekeepers

Success in this work was accomplished by attacking the problem of educating the beekeeper on four fronts. Through personal visits, beginners schools, literature and beekeepers association meetings, the story of modern successful bee culture was told.

PERSONAL VISITS

As has been pointed out in previous reports of work in Extension Apiculture, there is no better way of teaching colony and apiary management than by actually working with the beekeeper in his own apiary. In his own bee yard, the beekeeper's interest is keenest and his particular problems uppermost in his mind. At meetings he often forgets some of the questions he wanted to ask. In his own yard these problems are before him and from the standpoint of the Extension worker the teaching materials are immediately available. In recognition of these facts the Extension worker made 237 personal visits to beekeepers. New personal contacts were made with 63 beekeepers, many of whom had never heard of beekeeping extension work, and all of whom had not previously received aid from the service.

BEGINNERS' SCHOOL

In Towson, Baltimore County, during March, April and May, the first Extension school in bee culture was held. This school started as

an experiment. Prompting this experiment was the long and well recognized fact that the usual monthly beekeepers' association meeting was not proving entirely satisfactory as a medium for extension teaching. As explained in the Program of Work, these association meetings are attended by both beginners in bee culture and experienced beekeepers. The two together made a rather difficult combination to teach at one and the same time; the beginner desiring instruction in the fundamentals of the work while the experienced men were seeking the latest and most advanced steps. To alleviate this condition, and using Baltimore County as experimental territory, questionnaires were sent to all known beekeepers asking them to indicate whether they would be interested in attending a Beginners' School in Bee Culture, at which it would be assumed that everyone attending was a beginner and where the subject of bee culture would be discussed starting at the very beginning. They were also asked to indicate the most convenient night of the week to attend.

The response was surprising. Wednesday night was selected and the school started, continuing for nine weeks, with an average attendance of 40. The enrollment was not limited to beginners, as a number of the experienced bee men attended regularly.

The success of this initial school indicates that similar schools can be organized in other counties. They were not held later during 1936, on the advice of local beekeepers who felt they could not attend regularly during the growing season and who wished them postponed until the early spring of 1937.

At the present time (January, 1937) returns from questionnaires sent to Washington, Frederick, Montgomery and Prince George's Counties indicate the desire of beekeepers in these counties to attend. Weekly schools will be organized in these counties and run concurrently.

ASSOCIATION MEETINGS

Five regular meetings of the Maryland State Beekeepers' Association were held during the year at which time educational talks and demonstrations were given either by the extension worker or by outstanding bee men connected with the U. S. D. A., or other institutions.

The talks at these meetings were of a more advanced nature than the beginners talks.

THE POLLEN BASKET

Through a mimeographed publication called "The Pollen Basket" considerable educational information about bee culture was disseminated. This sheet started its second year in 1936. It is well liked and read, as indicated by letters received commending it, and by frequent reference to it at beekeepers meetings, and in personal talks

with beekeepers. A number of the beekeepers are keeping copies on file for reference.

"The Pollen Basket" has a threefold purpose. First, as a mouthpiece through which material of an educational nature can be broadcast by the extension worker. Second, as a medium through which will be fostered among the state beekeepers a feeling of unity, common purpose and fraternity, and third as a practical method of sending out notices of meetings and other events of interest to beekeepers.

PROBLEMS GIVEN SPECIAL ATTENTION

The backbone of successful bee culture is *colony and apiary management*, which includes the big three fundamentals; good wintering, proper spring increase and control of swarming. A colony that winters so as to survive until spring with a minimum loss of individual bees and bee energy during the winter; that then increases in size by egg laying so that it reaches its peak in number of field bees at the time the major honey flows are available and that can be dissuaded then, from weakening itself by swarming when this peak is reached, will be a surplus honey producer. These three steps are the rock-bottom fundamentals of honey production. Only colonies than can be so managed are profitable. A failure in any one of these three steps results in failure. This combined problem, therefore, containing as it does, the whole of bee behavior, colony reactions and intelligent manipulations of equipment, was given the greatest attention.

The ignorance of the average beekeeper of the tie-up between these three fundamentals can only be appreciated by one who has been intimately associated with bee culture in the state. In a large number of apiaries the extent of swarming and the number of swarms caught is actually looked upon as the index of success, the reason being that years ago when half the colonies were killed in the fall to remove the honey crop it was necessary to have double the spring count (by catching swarms) in the fall, to maintain the original number of colonies in the apiary. Those were the days when an average of 15 to 20 pounds of honey per colony was considered good.

The yearly winter loss in colonies actually killed outright in Maryland is estimated over a period of years at about 12%. The winter of 1935-36 was exceptionally severe on over-wintering bees and the loss is estimated to have been about 40% of all colonies in the state for this period, which means that approximately 12,000 colonies died, causing a monetary loss of not less than $40,000. This does not include the value of honey lost, which would, in a normal year amount to approximately $36,000. These figures should give added weight to the old statement well known in apicultural circles that winter loss annually accounts for the death of more colonies than all other adverse factors combined, including disease.

The period of spring build up in colony population is an extremely crucial period in the yearly cycle of the colony. Too rapid a build-up may result in a tendency to swarm before the coming of the major honey flow, a condition which is difficult to control. Too slow a spring strengthening of the colony population results in a colony not having enough field bees in readiness to collect available nectar when the honey flow begins. The importance of these rather technical differences is not imaginary. Colony production is based very definitely upon the strength of the field force at the time nectar is being secreted by nearby honey plants.

With these facts clearly in mind it was the major aim of the Extension worker to teach as much bee and colony behavior as possible; to recommend the best hive equipment and ground the beekeeper in the methods of equipment manipulation found best under Maryland conditions.

The campaign to *eliminate the antiquated and unprofitable box hive* is slowly taking effect, as a large number of colonies in the state are being equipped with movable frames for the home-made boxes or have been transferred to new movable frame equipment.

The two-story hive was recommended in all cases and it is gratifying that the number of beekeepers who are at least trying out this plan with a portion of their colonies is nearly 100% of the beekeepers visited or met at meetings. The superiority of the two-story arrangement is so marked that a fair trial will convince most of the men of the desirability of extending this feature of management to all of the colonies in the spring.

Generally *poor stock* is one of the most serious drawbacks to Maryland bee culture. Bees from poor stock are difficult to manage, sting excessively, are at least very difficult to keep from swarming, do not winter well and are generally more susceptible to invasions of wax moths and European foul-brood infection. Colonies headed by old queens do not build up properly in the spring and the queens are often superseded at a crucial time in the spring build-up period, resulting in a cessation of egg laying and adult emergence at a time when it can be ill afforded.

As first planned, the campaign for the improvement of stock and biennial requeening called for a liberal requeening of apiaries by the extension worker himself, using queens purchased by the beekeeper. It was soon noted, when requests for this service began to come in, that this system would soon get entirely out of hand and if practiced would consume all of the extension worker's time. To meet this condition it was necessary to agree to requeen only several colonies in an apiary, to demonstrate how it should be done and then leave it to the beekeeper to finish the job. Three reasons dictated this change of

procedure. First, the number of requests for requeening; second, the length of time required to requeen a colony, and third, a feeling of financial responsibility directed at the extension worker by the beekeeper when introduced queens were not accepted or were soon superseded, a situation commonly experienced under normal conditions.

It is felt that the requeening campaign led to one of the outstanding trends in Maryland beekeeping for the year, as witnessed by the facts that Maryland's only commercial queen breeder could not begin to fill his orders; the several beekeepers acting as agents for southern queen breeders did their best year's business and starting in 1937 a number of experienced bee men, qualified to do so, are anticipating going into the queen rearing business as part of their beekeeping activity.

One other point is worth mentioning at this time regarding the requeening campaign. A list was made of beekeepers in, what might be called strategic positions, that is, country storekeepers, barbers, bee supply agents and others likely to come in contact frequently with other bee men. These men were not only convinced of the desirability of biennial requeening, but their whole apiaries were requeened by the extension worker, the idea being of course that they having acquiesced in the campaign, and coming in contact with a large number of local beekeepers, would spread the news and tell the story of the benefits of good young stock.

The value of keeping accurate records and accounts, something seldom practiced by beekeepers, was given considerable attention. Mimeographed schedules were made available again this year and an increased number of beekeepers put them to use. It is felt that it will be only a matter of time and constant stimulation until the majority of beekeepers will be using these sheets. They all agree that they should keep books. The simplicity of the prepared record sheets will make it easy.

Education in the diagnosis and control of bee diseases was given major attention at all times. Talks of an educational nature were given at beekeepers meetings where diseased combs were displayed and both macroscopic and microscopic examinations were made. In the apiary the disease problem was usually discussed and detailed description of eradication procedure was given. Statistics regarding inspections are given elsewhere in this report.

The Maryland *infestation of the Bee Louse, Braula coeca,* was further studied this year primarily to chart its distribution and extent. Infested apiaries were found located as far west in the state as Hagerstown. The area now included in the infested area includes the following counties: Montgomery, Frederick, Washington, Carroll and Baltimore Counties.

The problem of properly *packing and marketing* the honey crop was given the usual attention. At all times the beekeepers were urged

to adhere to the U. S. D. A. standards and grades for honey. Considerable time on each visit was spent in instructing the beekeeper in the best methods of handling comb honey, little stress being given to the market preparation of extracted honey as there are not many ways in which the beekeeper can go wrong in getting liquid honey ready for sale. Furthermore, most bee men who produced extracted honey are experienced enough to understand the rather simple procedure and are aware of the several dangers to be avoided, such as over heating and fermentation. These extracted honey producers were urged through literature and personal talks, to investigate the possibilities for the sale of "Honey Butter" a little used form of honey, but one which the extension worker has found to hold very bright possibilities.

The comb honey producers on the other hand were urged to use the "Carbolic Cloth" method of honey removal from the hive, for quickness, to decrease robbing, and to avoid possible uncapping as often happens when the bees were merely smoked out of the supers. They were given instructions in how to clean up sections, how to grade, wrap and store them. The reason this work was stressed particularly in Montgomery, Frederick and Washington Counties is that the bulk of the honey produced in this area is comb honey, and, in general, its appearance is definitely inferior as compared with No. 1 out-of-state honey, shipped in by dealers, and because it will be necessary to improve the appearance of comb honey if it is to compete with comb honey brought in from Pennsylvania, Virginia and West Virginia. It is apparent that success is being enjoyed along this line, as shown in the superiority in appearance this fall of Maryland comb honey on the Hagerstown market, and at roadside stands.

Educational Work with 4-H Club Members

At the beginning of the year a 4-H Club Apicultural Project was drawn up and submitted to the state leaders.

Several days were spent working with a group of 4-H Club boys in the vicinity of Monkton, Baltimore County, who owned bee colonies, and with another group near Poolesville, Montgomery County.

Two days were spent at the Harford County 4-H Club Camp at Rocks, Md.

Inspection and Disease Control

All requests for inspection were complied with. The areas in and about the cities of Baltimore and Washington remain generally infected and render beekeeping in these locations precarious. These conditions have obtained for years, have caused large losses in colonies and equipment and present a serious drawback to bee culture in these areas. A one-man area clean-up campaign in these areas cannot be

handled by the extension worker along with the regular duties of his job, and it is for this reason that a request for part time area inspectors has been made.

Following is a summary of the inspection work done.

Number of apiaries inspected	48
Number of apiaries found diseased	10
Per cent of apiaries found diseased	20.8
Number of colonies inspected	528
Number of colonies found diseased	93
Per cent colonies found diseased	17.5

In addition to the field inspections, a number of samples of brood comb, sent to this office were examined.

Orchard Pollination

Increased interest is being shown by fruit growers in obtaining bee colonies for use in orchard pollination. Numerous requests were received from fruit growers, desiring information as to where colonies could be rented. In all cases contacts were made with beekeepers, and help given the orchardist in determining the number of colonies necessary and their placing.

Honey Marketing and Publicity

Workers in apiculture are generally in accord in the belief that the greatest drawback to the honey business in former years was the lack of any real worthwhile advertising of the product. They are also convinced that the national increase per capita consumption recorded in the last two or three years has been due almost entirely to the increased volume of advertising honey has received.

With this in mind a real effort was made to secure as much advertising for honey in Maryland as possible, with no funds and with the limited facilities available.

Generous use was made of the radio. Ten educational radio talks about bees and honey were broadcast over three Maryland Stations.

Three county fair exhibits of Maryland honey were assembled. The annual honey exhibit was set up at the Timonium Fair in Baltimore County and attracted the usual interested crowds.

In addition, success was experienced in obtaining excellently located spaces in both the Hagerstown (Washington County), and Frederick (Frederick County) Fairs. For years a group of beekeepers in these two counties have desired to exhibit their products and had tried unsuccessfully to obtain space for exhibition. The extension worker was fortunate this year in obtaining both adequate and well located space and personally set up the exhibitions of honey brought in by the beekeepers. The success of these two new fair

exhibits is indicated by the fact that increased space will be necessary next year to care for the demand for exhibits and that this increased space will be forthcoming from fair officials who were surprised at the interest exhibited by both local beekeepers and spectators in the displays.

A series of demonstrations of honey and its uses, lasting one week, was given in one of Baltimore's leading department stores, in an effort to bring honey to the attention of the city housewife. Excellent newspaper advertising was obtained through these demonstrations and it is estimated that over 5,000 women were personally contacted during the demonstrations. The honey used was Maryland honey, produced and packaged by a Maryland beekeeper, and the display attracted, in addition to the store patrons, a number of Maryland honey producers who were benefited from the standpoint of education in packaging and marketing practices.

Several articles about bees and honey, slanted for the consumer, were published during the year, one in "The Southern Planter" and two in the "Extension Service News."

Starting October 1, a study of the Maryland beekeeping industry and the state honey market was begun in cooperation with the Department of Agricultural Economics, of the University of Maryland. Mr. William Boarman, of that department, was assigned to the study. Mr. Boarman's death, after only three months work, during which time he had experienced signal success in the market study, came as a distinct shock to his associates and has occasioned a temporary lapse in the work.

In an effort to develop new outlets for honey, the extension worker contacted the largest canning concern in the state, and presented the idea of using small quantities of strong flavored, dark grades of honey in baked beans. As a result the research department of this concern has started investigations to determine the adaptability of honey for this purpose. Should it be found practicable, and should honey be used in this manner, not only will large amounts of honey be consumed, but a tremendous amount of advertising will be forthcoming.

Attendance at International Beekeeping Conference

In November, the extension worker attended the meetings of the American Honey Producers' League, and affiliated organizations held in San Antonio, Texas. It is felt that attendance at these meetings was well worthwhile, as the 1937 convention was brought to Washington, D. C., which will give Maryland and Eastern beekeepers an opportunity to take an active part in convention activities, and because the extension worker was elected Secretary-Treasurer of the American Honey Producers' League, the only national organization of beekeepers.

PROGRESS REPORT OF THE MARYLAND BEEKEEPING INDUSTRY

By WILLIAM F. BOARMAN

Graduate Assistant, University of Maryland

The object of this study is to determine the present status of apiaries in the State and to determine the possibility of honey production as a supplementary source of income. In this study, we will endeavor to analyze the organization of apiaries and the practices followed by various beekeepers in the production of honey. The factors that determine the efficiency of production will be evaluated as to their relative importance in influencing income. Information is now being secured on marketing practices, methods of sale, and prices.

This study is to be conducted over a period of two years, and the information received will be analyzed by the Department of Agricultural Economics of the University of Maryland and the results will be presented for publication. All expenses of the study are taken care of by funds allocated by the Maryland Agricultural Experiment Station. Each year a fund is set aside for experimental purposes and, therefore, this work is being carried on at no additional expense to anyone.

The following agencies were interviewed, and by means of a questionnaire, the data below were obtained:

Wholesalers—The three most important operations in the wholesale market are: (1) Concentration of products from growers; (2) the dispersion of these products to other markets, and to retailers; and (3) speculation.

Of the fifteen wholesalers interviewed in the City of Baltimore, ten of them handled honey. During the past year, these wholesalers handled a total of 38,983 pounds of extracted honey and disposed of it through 2,295 stores in containers ranging from four ounces to 600-pound barrels. Not one of these men had any trouble keeping supplies, nor was there any variation in the quality or color of the honey handled during the past twelve months. All honey passing through these ten wholesale grocerymen was produced out of the State. It may be interesting to note at this point that none of these wholesalers handled comb honey.

Independent Retail Stores—The storekeepers interviewed extended over an area of 12 counties. In this area was included the Eastern Shore and Baltimore, Harford, Frederick and Montgomery counties on the Western Shore. Information received from these stores indicates that the comb honey business in this section is very small. Out of the 224 stores studied, there were only nine that reported comb

honey sales, and of these, seven stores had comb honey on hand for three months; one store, for four months; and one store, for nine months. These nine stores sold a total of 930 pounds of comb honey last year, 642 pounds of which came from local producers in the state while 288 pounds came from wholesalers out of the State.

The extracted honey business in my mind is most important, because with the information we have on hand at present, the trend of the consumer seems to be toward extracted honey in the twelve counties studied. Of the 224 stores reporting sales of extracted honey, there was a great demand for the one-pound package. The containers of honey sold ranged from the four-ounce to the three-pound size. The modern housewife of today demands a package that is easy to handle, and therefore, according to the data collected, the one-pound package seems to be the best seller.

The total sales of extracted honey for the 224 stores was 22,740 pounds. Of this amount, 20,436 pounds were produced in the State. Out of the 224 stores only four bought their honey from local producers, while 220 stores purchased their honey from wholesalers.

It may be surprising to note that only twenty-two of the 224 stores displayed honey but these stores were rewarded with a large volume of sales. Likewise, the small number of stores displaying comb honey had a greater volume of sales than those who merely carried honey as an article of merchandise.

Roadside Markets—This type of market handles a surprisingly large quantity of honey. During 1936 there was a total of 15,258 pounds of extracted honey and 720 pounds of comb honey passing through nine roadside markets. This large volume of sales was due primarily to the very good honey displays of these markets. All of these markets, with the exception of one, were located in close proximity to Washington. Besides honey they handled a large variety of farm produce. These markets carried containers of honey ranging in size from eight ounces to five pounds, with the eight-ounce size being the best seller in all cases.

All of the markets reported that containers having labels on them did not move as rapidly as those having no labels, because if a jar of honey is labeled, the customer thinks that it is not pure honey and, therefore, will not purchase it. Of the 15,258 pounds of honey sold through these nine roadside markets, 15,144 pounds were produced out of state and brought in by jobbers. Approximately one-half of the customers bought honey at these markets by chance while the other customers were regular buyers.

Bakeries—Probably one of the largest channels through which honey goes is the bakery. At present only a limited amount of data have been collected from bakeries in this state, but the ten bakeries studied produced some surprising results. These bakeries were located

in Baltimore, Hagerstown, and Washington. Eight of the ten bakeries interviewed used honey in the marketing of bread and pastry. There was a total of 122,140 pounds of honey used by these eight bakeries during 1936 and all of this honey was produced out of the state.

Of the 200,771 pounds of honey handled by the various agencies during 1936, 197,321 pounds were produced out of the State of Maryland, leaving only 3,450 pounds of honey that came from producers in the State.

Bees for Pollination Purposes.—In this study there is also an attempt being made to show the part that bees play in pollination work. At present seventy-five commercial orchardmen have reported concerning this matter. There was a total of 694 colonies used by these men for pollinating their fruit trees. Reports have been obtained from all over the entire state and we think that the seventy-five men reporting give an adequate sample for this work. Ten farms in the state reported a total of 455 colonies rented during 1936 with a total of 100 colonies rented in addition to those kept on farms. There was a total of 547 colonies of bees on farms for pollination purposes. Whether the number of bees on farms at present is adequate for pollination, we canont say, but we will endeavor to give you more information concerning them in the future.

Summary

At present the wholesaler seems to have the upper hand, and the wholesaler as a general rule buys his honey from out of the state, because he says that he can get a more uniform product. Practically all of the stores studied replied that they would buy Maryland honey if the producer would use greater precaution in extracting his honey and then put it up in an attractive container. A large number of storekeepers replied that the customer would purchase products put up in an attractive package in preference to an unattractive one, although the quality of both products was the same. If honey is dark today, and light next week, the customer becomes suspicious and will probably stop buying it. Large wholesalers buy a standardized product and can, therefore, furnish the customer with a uniform product the year round.

The sources of Maryland honey are now being studied and also the physical factors that are responsible for the variations in production from year to year. The beekeeper is now reporting on the plants that are a source of honey in his community, and the approximate blooming dates thereof.

At this time, sufficient data are not available pertaining to the apiary, but with the co-operation of the Maryland beekeeper we will be able to give you some interesting information in the future.

THE NATIONAL HONEY MARKET

By HAROLD J. CLAY

U. S. Department of Agriculture
Bureau of Agricultural Economics

At the recent International Honey Conference held at San Antonio, Texas, Mr. R. E. Foster, State Apiarist of Florida, remarked that those present were delegates representing 23 billion individuals. Similarly, I might say that you folks gathered here are the delegates of at least 100 million individuals. Certainly you represent more "producers" than any other meeting ever held in Maryland.

The contrast with every other agricultural gathering, however, is that it is not the producer in this case who is interested in finding a market for his product. In fact, even some of you may not be very much concerned about actually marketing the honey you produce. No one knows how many beekeepers there are in the United States. Dr. Phillips, some years ago, used to talk about a million beekeepers. Even 500 thousand would indicate that beekeeping is very widely spread. Yet of this 500 thousand there are certainly many thousands—possibly 100 thousand or more—who are not concerned with the marketing of their honey. They like to "fool with the bees," just as other people "fool with dahlias" or other flowers and spend considerable money on them with no thought of financial return.

One of the modern trends which has an effect on the marketing of honey is the gradual decrease in the numbers of the so-called "farmer beekeeper," and the concentration of the production of honey in the hands of a smaller number of men who keep bees because of the profit which they can make from the honey. Incidentally, it is interesting to note that during the recent depression, or period of economic readjustment if you prefer that phrase, the records indicate that commercial beekeepers fared far better than almost any other group of farmers, and very few were compelled to go "over the hill to the poorhouse."

Bartering of Honey

A moment ago I said that the farmer beekeeper was gradually decreasing in importance. Along with this change has come a change in methods of marketing honey. Seventy-five years ago most farmers had a few hives just as they had a few hens. Usually they paid little attention to the bees except to cut out the honey from the primitive hives once a year and to gather an occasional swarm in the spring and summer. When the farmer of that day had surplus honey he usually took it to the country store and exchanged it for groceries or shoes.

The bartering of honey for other products is by no means over. In

fact, it received a definite stimulus a few years ago when cash money was so scarce. Beekeepers frequently exchanged honey for gas, automobile tires, food products, and even for lumber and labor with which to make repairs to their houses. Reports have been received of many beekeepers who found that carpenters or bricklayers, for example, who were out of work were willing to exchange their time and labor for a few cans of honey. Thus the beekeeper has a medium of exchange which is often as useful as hard cash, and which can take the place of money even more widely than it has.

Sales Direct to the Consumer

The next step in the marketing of honey following that of the primitive barter was selling it direct to the consumer. This was widely done in the days when people living in towns and small cities preferred to buy their butter, eggs, potatoes and other farm produce direct from the farmer. Even today, when fruits and vegetables and even dairy products are generally bought at the store, many small beekeepers find they can make more money by packing their honey in small pails or bottles and selling it personally or through agents to the consumer. Beekeepers often hire high school children or men or women out of work to assist them in disposing of their honey, usually paying them on a commission basis.

The increased use of the truck as a means of transportation has not passed unnoticed by beekeepers and many of them have established regular truck-routes, sometimes covering several hundred miles and making regular circuits over which the truck passes every few months. This method of sale is especially noticeable west of the Mississippi, where beekeepers with several hundred colonies sometimes dispose of their entire crop in this way. The drivers on truck routes report that selling a 60-pound can of honey to a farmer with a large family is often no more difficult than selling a 10-pound pail to a city family, and that repeat orders are about as frequent.

Clean Honey Houses

Whether a man sells honey to his neighbors or to others in the same community or to distant consumers, he should make a point of having his honey house and premises particularly clean. Any customer has a right to expect clean honey. The slogan, "Honey the purest of foods," has been widely used, but is this slogan correct? How many beekeepers always strain their honey carefully, use clean containers, and a neat attractive label, and handle the operations in the honey house in a clean fashion? These should be a matter of course.

Honey kills germs, we are told, and we know that honey is a sticky product. When one goes into a honey house, however, and sees a film of live and dead bees on the honey in the settling tank, and slides around on a gooey, sticky floor (and these conditions will be

found in a surprising number of honey houses) it takes a real conviction that honey is fine stuff to keep up one's enthusiasm for it.

Bottling of Honey an Important Industry

As the production of honey became more of a commercial industry, more and more honey came to be sold to commission men, wholesale handlers and large bottlers, and most of the commercial crop of the country is handled today in that way, even though beekeepers continue to sell millions of pounds direct to the consumer and to nearby grocers.

One of the trends of modern day honey marketing is the apparent concentration of the bottling of honey in the hands of a few large concerns. It has been estimated that 50 to 75 million pounds of honey yearly are being bottled or packed in small containers, not solely by large bottlers, it is true, for there are still thousands of small bottlers, including beekeepers, who think they can put out just as nice a pack as the larger commercial concerns. And no doubt they can, if they will give sufficient attention to proper straining, and if they have adequate facilities for quickly cooling the honey after it has been heated.

Roadside Stands Need Advertising

Certainly there is still a definite field for beekeepers to bottle and sell their own honey. There are still millions of people who feel that the only way to get pure honey is to buy it direct from the beekeeper, just as there are some folks who are still suspicious of any honey which is not in the comb because of the extensive amount of adulteration of extracted honey which was done before the passage of the Pure Food Law in 1906. We all know of people who never purchase honey except when they are out on an automobile trip and see it at a roadside stand, and who prefer to buy it from a man whose authenticity as a beekeeper is testified to by the fact that he has placed several hives of bees near the stand for advertising purposes.

Beekeepers who have roadside stands need, however, to do other advertising, such as having signs along the road in both directions. Furthermore, in these days of fast-traveling automobiles, unless the first sign is at least half a mile away it is not likely to prove very effective. To have the first sign a mile away is still better as it gives the people driving along an opportunity to decide before they reach the beekeeper's stand whether or not they want to stop.

Honey sold at roadside stands should not be disposed of too cheaply. If the price is nearly up to that which the beekeeper can obtain by direct sale he will probably move about as much honey, and such is the curious psychology of buyers that many purchasers will think the quality is higher than if the honey is priced too low.

The signs directing the attention of the autoist to the honey stand

ahead should not be too small and should contain as few words as possible. The cost of the signs constitutes a legitimate advertising expense.

American Honey Institute Makes Wide Contacts

Most beekeepers are not sold on the value of advertising to the extent that distributors are in many other industries. Some time ago I saw it stated that about 1½ billion dollars are spent yearly in America for advertising, or about 2 per cent of the volume of business of all kinds. If honey were advertised in the same proportion, perhaps $200,000 would be spent annually to tell people about the product. I have no knowledge of how much money is spent in advertising honey, but we all know that the amount is small.

Until recently national advertising was frowned upon by leaders in the honey industry because of its expense and because there seemed to be no simple way to share that expense among a large number of people. As the American Honey Institute has developed, however, there has been a general agreement among everyone connected with the honey industry that the Institute, which was organized to make people "honey-conscious," is the best medium for this purpose. Advertisers in other fields have high praise for Mrs. Jensen and her associates and their unique method of contacting educators and manufacturers of various food products on an amazingly small budget. Hundreds of thousands of dollars of free advertising have been given the honey industry by various food manufacturers, and much of this has been due to the activities of the American Honey Institute.

Exports Greatly Curtailed

One factor in the marketing picture has changed definitely during recent years. I refer to the slackening exports of honey. The United States was on an import basis for years, bringing in millions of pounds of honey almost 100 years ago. Exports were not seriously thought of until less than 20 years ago, when they jumped suddenly. For the fiscal year 1918 net exports totaled over 13,000,000 pounds, and even as late as the fiscal year 1929 they were nearly 12,000,000 pounds. Since then they have fallen off until less than 2,000,000 pounds were exported during the past fiscal year.

Why is this? Simply that our best foreign customers of the recent past have apparently said "Europe for the Europeans and for those associated with them" and have acted to that end. Higher tariff rates, insistence upon a certain diastase content, unwillingness to take care of trade debits except through shipments of goods to this country, often of greater value, the balance to be paid to the European buyer in cash,—these and other factors have contributed to lessening the interest abroad in our honey.

During the past few months, however, exporters on the Pacific Coast report a substantial increase in the demand for comb honey from Great Britain, and especially from Scotland. These exporters have about exhausted the supply of comb honey west of the Continental Divide, and if it were not for the shipping strike curtailing the movement of all shipping they would probably be making more inquiries in the East for comb honey with which to supply the European demand.

Lighter Production of Comb Honey

But stocks of comb honey are light in the East also. Even as recently as 1909, Government figures indicated that only 35 per cent of the production of honey was in the extracted form. Today, no doubt fully 80 per cent of the honey output of the country is extracted, and some leaders in the industry are disturbed lest the production of comb honey be practically eliminated before many more years. Mr. E. R. Root says that firms making comb sections are putting out about only one-fourth as many sections as they did 25 years ago, which lends emphasis to the other percentage figures which I have given.

Government Honey Market News Reports

If time permitted I could go into considerable detail regarding the reasons why the production of comb honey has fallen off so sharply. I would like also to talk about the greatly increased use of honey by bakers. However, fully 15 minutes of my time has gone and I want to say a few words about the Honey Market News Reports which serve as the basic reason for my interest in the industry.

These reports are prepared through the cooperation of hundreds of beekeepers and honey shippers who receive no pay for their service but who send us a record of the prices at which honey is selling in their parts of the country, together with comments about the condition of bees and honey plants. We have a few faithful reporters from Maryland, but we can use more and if any of you are willing to join this group of conscientious beekeepers and will send me information covering your part of the State I shall be happy to have your assistance.

In addition to producing-section news we give prevailing wholesale prices in a number of consuming markets in which the Department maintains salaried representatives. It should be emphasized, however, that the prices which we publish from these consuming markets are not those which the beekeeper receives from the man to whom he sells, but the prices obtained by city dealers when they sell to bottlers, bakers, grocers, etc., after paying transportation, drayage and storage charges and after deducting their own profits. Therefore, do not expect to receive our published prices if you ship to one of the cities appearing in the Government Market News Reports.

These Honey Market News Reports are of course only a brief sum-

mary of what has taken place in the recent past. Their chief value lies in their stabilizing influence. Market reports aid beekeepers, shippers and dealers by giving them an unbiased picture of prices and conditions prevailing in producing areas and in consuming markets, and to that extent they prevent unscrupulous buyers from misrepresenting market facts to uninformed beekeepers. We are told by many beekeepers that the honey reports are really helpful to them. If you arn't receiving the reports and want to be placed on the mailing list for them, just let me know.

ABILITY OF HONEY TO ABSORB AND RETAIN MOISTURE, AND PRACTICAL APPLICATIONS TO PROMOTE GREATER USE OF HONEY

By R. E. LOTHROP

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In promoting the use of honey great stress has been placed on two of its valuable qualities; namely flavor and high energy value as a food. These are indeed very valuable characteristics of honey. It is important, however, to consider also some other characteristic properties of honey which are of great importance in its utilization and which are indeed, the determining factor from the standpoint of certain large, potential industrial consumers.

Very little exact information is available on certain of the properties of honey, as well as its behavior under various conditions of use. In many cases this information would be quite valuable for promoting the use of honey for certain purposes. It would also indicate which type or types of honey are most suited for specific purposes. This consideration is of particular importance in view of the very wide variation in character and behavior of honeys from different floral sources.

More suitable market outlets for certain types of honey, which are not well adapted to table purposes is very desirable. This honey is frequently difficult to dispose of for table use even at comparatively low prices. It is probably true that marketing of this honey for table use tends to depress the sale of the better grades of honey. It is hardly to be expected that new honey customers will be attracted to honey by offering them this type of honey for table use. It would be better to dispose of such honey for purposes for which some property or quality of the honey besides flavor or appearance could be more advantageously utilized.

Ability of Honey to Absorb and Retain Moisture

One of the properties of honey that has been recognized to a certain extent, but regarding which there is little exact knowledge, is its power

to absorb and to retain moisture. This is known technically as "hygroscopicity." This behavior must be reckoned with in the storage of honey. When stored at comparatively low temperatures under moist atmospheric conditions, moisture is absorbed and dilution of the honey takes place, which in turn tends to promote fermentation. On the other hand, storage under conditions of low atmospheric humidity will result in loss of moisture from the honey, so that it tends to become heavier in body.

These facts are comparatively well known to those engaged in handling honey, and probably do not need repetition here. This same property of honey, however, has not been so carefully considered in connection with its utilization, and it is this particular phase of the question that I wish to emphasize most in considering the hygroscopic nature of honey.

Relative Hygroscopicity of Honey and Other Saccharine Liquids

To what is the hygroscopic nature of honey due? In a general way saccharine liquids of all kinds tend to absorb moisture. Ordinary cane sugar syrup is hygroscopic; and so are glucose syrup, and commercial invert sugar syrup and malt syrup. Sugars in general are hygroscopic by nature, and this property can be and is utilized advantageously in a number of industrial processes. There are, however, marked differences in the degree to which this particular property is exhibited by various sugar syrups, and this must be taken into consideration in using these materials whenever hygroscopicity is a factor to be considered. In addition, of course, the value of the hygroscopic agent depends on the degree to which it exhibits this ability to absorb and retain moisture.

The relative ability of the different kinds of sugars to absorb and retain moisture has been investigated to a limited extent. It is known, for example, that levulose, which is the predominant sugar present in honey is more hygroscopic than most other sugars. It is not difficult to determine these facts as long as we are dealing with pure sugars. In case of natural products such as honey, however certain non-sugars substances which are present apparently exert a very marked influence on hygroscopicity, so that honey behaves quite differently from what would be anticipated if it is considered only from the standpoint of the sugars present.

Browne has shown that under certain conditions honey is more hygroscopic than either invert sugar or levulose. He also found impure levulose to be more hygroscopic than the pure sugar. The limited studies that have been conducted along this line indicate that the hygroscopicity of saccharine substances such as honey depends on the composition, both from the standpoint of the sugars present, and from the standpoint of certain non-sugar constituents that are present in

comparatively small amounts. Since the composition of honey varies considerably from both of these standpoints, we would expect different types of honey to show corresponding differences in hygroscopicity.

An investigation was made, therefore, to obtain some information on the relative hygroscopicity of various types of honeys as compared with common sugar syrups. Honeys of a number of different types were chosen so as to include those representing extremes in composition. For example, tupelo honey was selected because of its unusually high levulose content, mesquite honey for its comparatively high dextrose content, tulip-poplar honey for high non-sugar content, buckwheat honey for high content of colloidal constituents, etc.

Small quantities of these honeys, and also the sugar syrups that were to be compared with honey, were carefully weighed and spread over the surface of small glass containers. These were then placed in closed chambers and kept under controlled conditions of temperature and atmospheric humidity. The loss or gain in weight of each sample was determined from time to time. This was continued until the weight of each sample became constant, i. e., until no loss or gain in weight occurred. Tests were conducted with the honeys at their original densities, and also with all samples adjusted to exactly the same moisture content (20%) for comparative purposes. The temperature used for most of the tests was 68° F. The degree of atmospheric humidity to which the samples were exposed varied in different tests from 30% to 70%, expressed as per cent relative humidity.

Time does not permit an extended discussion of the various values obtained. I would like, however, to give a brief summary of these results. On the tests conducted with the honeys at their original densities, it was found that at 68° F., which is near average room temperature, honey of approximately normal density neither lost nor absorbed moisture at 60% atmospheric relative humidity. This point was found to vary somewhat, due in part to differences in density among the samples, being a little higher for high density and a little lower for low density honeys.

Using this value of 60% atmospheric relative humidity as the critical point of moisture absorption for honey, and consulting relative humidity charts for various sections of the country, the following generalization may be made. When stored out-of-doors in winter, honey of approximately normal density would tend to absorb moisture in all sections of the United States except in the large area lying between Texas and the Pacific Coast, and north to Montana and Idaho. In summer, on the other hand, honey would be so affected only in the area bordering the Gulf of Mexico and the Atlantic Coast, and in the northern Michigan area.

When the tests were conducted on honey samples that had been adjusted to 20% moisture content in all cases, the critical point for moisture absorption was observed to lie between 60 and 65% atmos-

pheric relative humidity. This point varied somewhat among the different samples due to differences in composition. The honeys were found to be more hygroscopic than commercial invert sugar syrup, and much more hygroscopic than commercial glucose syrup, but less hygroscopic than a syrup prepared from levulose. Levulose, either as a sugar or a syrup, is, however, not a commercial article and certain honeys of types which contain a high percentage of levulose are the most suitable saccharine products available for specific uses for which levulose sugar is desired. The high levulose content of honey of certain types may therefore be capitalized for certain specific uses.

We now come to the practical application of these observations. Practical baking tests were conducted to determine whether or not the ability of honey to retain moisture when it is mixed with the other ingredients in baked goods is comparable to its behavior in the pure state. The ability of certain constituents to retain moisture and to prevent drying out is of great value for use in baked goods, particularly in cakes. The hygroscopicity of honey, i. e., its ability to absorb and retain moisture, and thus to retard the drying out and staling of baked goods, is of great importance to the baker.

The tests were conducted in a manner similar to that in which the pure honeys and syrups were tested. A series of loaves of bread and a series of cakes were baked by a standard method and the losses in moisture when the loaves were exposed to controlled temperature and humidity conditions over a period of several days were recorded in each individual case. The loaves of bread were exposed to an atmospheric relative humidity of 60% at 68° F.; the cakes were exposed to 50% atmospheric humidity at 68° F.

The cakes in which the various honeys were used showed better moisture retaining qualities than those in which the other saccharine liquids were used (with the exception of levulose syrup). Buckwheat honey showed the least moisture loss of all the honeys tested. The results in the baking tests agreed well with the results obtained with the pure honeys and syrups. The results were more pronounced with the cakes than with bread owing to the larger amount of sugar, syrup or honey used in cakes. A complete grading of all breads and cakes baked was made by the standard scoring method and this served as an excellent means of comparison. In these tests, however, the primary object was to determine loss or retention of moisture. Besides the various honeys, the following saccharine materials were used in these tests: commercial invert sugar, commercial glucose, malt syrup, levulose syrup and cane sugar.

The foregoing results illustrate the practical utilization of a property of honey other than flavor or food value. It may be of interest to point out the very large potential market for honey for uses in

which hygroscopicity is a factor and in some cases the chief consideration.

The amount of sugar used in ordinary bread doughs usually ranges from 3% to 6% based on weight of flour used. The functions of sugar in bread baking which have usually been considered are: (1) a source of food for the yeast, with a resultant evolution of carbon dioxide gas that causes the bread to rise; (2) as a source of sweetness; (3) as a source of color for the crust. Honey serves all these purposes very well, and any added advantage of honey such as increased moisture retention that would retard drying-out and staling would give it a more decisive value in bread baking in comparison with competitive products.

On the basis of 25,000,000 pound loaves of bread baked by commercial bakeries daily in the United States, if honey were used in place of sugar (on a 3% basis), the entire domestic honey crop would be sufficient to supply only about one-half of the honey required. While it is not expected that this could be accomplished in the immediate future, these figures serve nevertheless to illustrate the very great magnitude of such potential outlets for honey.

Cakes and cookies. While there are no reliable figures available on the quantity of cakes and cookies baked by commercial bakeries in the United States, it is true that in recent years a very large increase in the quantity of cakes baked by commercial bakeries has taken place. This increased production is due primarily to a marked improvement in the quality of cakes produced by commercial bakeries which in turn is due largely to the use of ingredients of better quality.

Since large bakeries, like many other large industrial units, maintain technical staffs who are striving constantly to improve their products, they are quick to appreciate the technical advantages offered by certain types of ingredients. The use of hygroscopic agents such as commercial invert sugar, glycerine, etc. is a well established practice in cake baking. The advantage that honey offers in this respect over other similar saccharine materials should give it added value in cake baking.

While discussing the subject of baking, it is pertinent to point out that fifty years ago bread was baked largely in the home. Today, commercial bakeries furnish most of the bread consumed. During recent years the task of cake baking has also been passed on to commercial bakers to a constantly increasing extent.

Therefore, any program for promoting the use of honey for baking purposes must consider more and more the requirements of the commercial baker. I do not mean to imply that less emphasis should be placed on the use of honey in the home, or for home baking. The important point to keep in mind in connection with this commercial development is that commercial bakers are more exacting with respect

to their requirements and, because of their larger scale of operation, are more impressed by technical advantages than are home users. Consequently, the use of honey by bakeries, as well as by other large commercial users, must involve more and more a definite knowledge of the various properties of honey in relation to the requirements of the user.

Tobacco. A considerable quantity of sugar is used for treating tobacco, particularly plug and cigarette tobaccos. It acts as a hygroscopic agent to prevent drying of the tobacco. It will probably surprise many of you to learn that this use represents the largest single market outlet for maple sugar at the present time. One large manufacturer of cigarettes is reputed to use about 4,000,000 pounds of maple sugar annually for this purpose. A number of hygroscopic agents besides maple sugar are used in tobacco, some manufacturers preferring to use such substances as glycerine and diethylene glycol.

Cigarette manufacturers, as a rule, set up rigid requirements and specifications for the materials which they use. The hygroscopic nature of honey should be of distinct value when considering its suitability for use in tobacco. However, there are undoubtedly other factors besides hygroscopicity that influence the suitability of honey for this use. This is a subject which has never been studied adequately. Since such a use for honey represents a large potential market outlet, a thorough and detailed study of its suitability for this purpose is very desirable.

Other Industrial Outlets for Honey

There are a number of industries in addition to those already mentioned that offer outlets for comparatively large quantities of honey. In each case the utilization of honey by these industries involves a number of chemical and technical problems. These problems become much more involved when attempting to utilize a produce such as honey, which is subject to natural variations in composition and behavior, than is the case with manufactured products of more uniform composition. In this connection, it should also be pointed out that manufacturers of sugars and syrups maintain technical staffs which cooperate with the various industries in which their products are used, or may be used, for the purpose of promoting the use of these products. Such technical staffs are constantly occupied in solving problems that arise in connection with the use of their products.

Candy Manufacture. The problems involved in utilizing honey in candy manufacture are numerous. There are such questions as flavor and flavor retention, caramelization, effects on crystallization and moisture absorption and retention. Certain types of honey when used in candy are known to retain a greater proportion of the flavor-

ing constituents than others. Some types of honey withstand heating (less darkening in color) better than others.

Some honeys are known to froth badly when used in candy batches. Then there is the influence of certain non-sugar constituents of the honey on the type of crystals formed in the candy mass. There is probably no other industry which presents such a variety of chemical and technical problems in utilizing honey as does the candy industry.

Manufacture of Ice Cream and Ices. Here the problems involved are mainly suitability of flavor and influence on the texture and consistency of the frozen cream, which includes influence on the melting point. It is needless to emphasize the large potential outlet for honey for use in manufacture of ice cream and ices.

Brewing. Comparatively little information is available on the suitability of honey for this purpose. A considerable quantity of sugar, principally the sugar dextrose, is used by brewers in producing beer. It is interesting to note that this same sugar dextrose is present in honey. Materials which have been prepared especially for this purpose, and which are the result of considerable development work are manufactured and sold for this purpose.

There are a number of technical problems involved in the use of honey for such purposes, as for instance the rate and character of the fermentation of the sugars, the effect of the particular honey flavor on the character of the beer, the effect of honey non-sugars on the beer (for example the influence of proteins and other non-sugars on the turbidity and other characteristics of the beer). The use of honey has actually been tried by breweries, but so far the information developed regarding its merits, in comparison with competitive products, is extremely limited. The use of honey for brewing purposes would certainly call for careful study because of the exact requirements demanded.

Wine. The use of honey in wine making is a very old art. Various names such as mead and hydromel have been used to designate this product. Some of the problems involved in the use of honey for this purpose include a consideration of the flavor characteristics of the honey to be used; the extent to which this flavor is carried through the fermentation process to the final product; the effect of various types of wine yeast on both rate of fermentation and on flavor characteristics; the mineral constituents of honey and their influence on fermentation; and requirements as to addition to nutrient salts to facilitate the action of the yeast.

Vinegar. Since the processes of fermentation for wine and vinegar are closely related, the technical problems involved are quite similar. Honey intended for use in preparation of vinegar would probably be confined to the lower grades of honey and to waste honey.

In this brief review of a number of industries that offer very large potential market outlets for honey, it is not intended to convey the impression that no investigational work has been done with a view to utilizing honey for these purposes. On the contrary some excellent work has been carried out on various aspects of honey utilization. Rather, it is desired to point out the need of a much more systematic and a more thorough-going survey of these varied potential uses for honey. Particular emphasis should be placed on the more advantageous utilization of certain specific properties of honey with a view to greater and more varied use.

It should be further emphasized that the utilization of products by industries is based on technical knowledge. Manufacturers of sugar products generally maintain technical staffs to study the needs of various industries in connection with utilization of their products, and to solve problems that arise in the use of these products.

The same information is needed for honey. Every possible use of honey should be studied and each particular property of honey which makes it suitable for each type of use should be accurately determined; likewise, the relative importance of the various properties in relation to each type of use; and on this basis, the most suitable types of honey for each use should be ascertained.

Each kind of honey will thus find the use for which it is best suited and for which it will bring the best price. There will be a place for every kind of honey and the net result will be to the best advantage of the entire honey industry.

REPORT

OF THE

Maryland Vegetable Growers' Association

EIGHTEENTH ANNUAL MEETING

First Session
Wednesday, January 13, 1937
Baltimore, Maryland

The eighteenth annual meeting of the Maryland Vegetable Growers' Association was called to order at 10.30 by President Wm. P. Hotton.

President Hotton introduced Professor H. B. Cordner of the University of Maryland as the first speaker.

VARIETY TRIALS IN MARYLAND FOR 1936

H. B. CORDNER
University of Maryland

The Department of Horticulture, in cooperation with the Extension Service of the University of Maryland, is conducting variety trials with the major canning and market vegetables. These tests are located in several sections of the State and new, promising varieties are grown in comparison with standard types in order to determine the yielding ability and performance under Maryland's climatic conditions.

I am going to present a review of some of the results secured during the past season. The trials with canning crops were conducted at College Park and rather complete yield and canning data were secured. Trials with truck crops are in progress in Wicomico County, near Salisbury and the work at this location is carried out with the cooperation of Mr. J. P. Brown. In some instances duplicate trials were conducted at the two locations.

Tomato Varieties

The tomato crop is one of the most valuable crops produced in Maryland. Large quantities are canned and a limited part of the crop is marketed in the fresh state. The season of 1936 was especially favor-

able and unusually high yields were obtained. Considerable income was derived from the sale of market tomatoes in addition to that secured from the sale of tomatoes to the canning factory.

Canning Varieties. Three years of trials are completed at College Park and the results indicate that the best varieties at this location are Marglobe, Pritchard, and Greater Baltimore. Brown's Special has ranked in fourth place, while Rutgers performed very well in the past season. One season's test at Salisbury confirms the results secured at College Park. A few comments on some of these varieties might be of interest.

Table I (a). Tomato Variety Trials at College Park—1936. (Weaver Farm).

Variety	Yields as Tons Per Acre		Percent Marketable	Percent* Canned Stock	Wilt† Infection
	Total	Marketable			
Rutgers	18.9	16.5	87	82	1
Marglobe (Master)	18.6	15.3	82	80	0
Marglobe Selection	17.0	15.2	89	82	0
Browns Special	17.3	13.9	81	81	22
Pritchard	17.1	13.2	74	80	10
Tri-State (Balto.)	14.7	12.2	83	81	43
Greater Baltimore	15.2	11.8	77	81	29
Indiana Baltimore	15.9	11.4	72	80	31

*Raw Stock minus waste in peeling.
†Percentage of plants severely infected with wilt.

Table I (b). Tomato Variety Trials—Salisbury.

Variety	Yields as Tons Per Acre		Percent Marketable
	Total	Marketable	
Canning Varieties:			
Marglobe	16.9	13.3	79
Pritchard	16.7	12.8	77
Greater Baltimore	15.7	11.1	71
Browns Special	13.5	8.9	66
Market Varieties:			
Glovel	17.0	13.3	78
Break O'Day	16.8	13.6	81
Scarlet Dawn	15.6	13.1	84
Grothens Globe	15.2	12.4	81
Gulf State	15.6	12.4	79

Rutgers. This was introduced by the New Jersey Station and is a late variety producing a large, luxuriant vine. Fruits are large, almost globular, developing a deep red internal color, but with less reddening evident from the outside. This peculiarity must be recognized in the harvesting and grading of the fruits. The variety is most probably wilt resistant and is gaining in favor in this section as a canning variety.

Pritchard. A popular early canner and market variety, introduced by the U. S. D. A. Plants are resistant to wilt, moderately vegetative and productive. Fruits are of medium size, almost round, and are in season four to seven days in advance of those of Marglobe.

Browns Special. A late canning variety. Originated in New Jersey and is gaining in production throughout this region. In Maryland it is most popular in the Eastern Shore section. Plant is large and vegetative, fruits are about equal to Rutgers in size, but are flattened and a few days earlier in season. This variety has not been especially productive in the trials and is not wilt resistant. The vigorous vine growth should be an asset when the variety is grown on light, sandy soils.

Marglobe. Stokes Master Marglobe has been grown during the past two seasons and has been found to be free of wilt, and productive with good quality fruits. A large fruited *Marglobe Selection* was tried at College Park this season. Fruit size exceeds all other varieties, with the marketable yield equivalent to that of Master Marglobe. Quality and size were maintained at a relatively high level throughout the latter part of the harvest season.

Baltimores. Tri-State, Indiana, and Greater Baltimore types have been grown in the trials. All are susceptible to wilt and were severely infected during the past season.

On the basis of performance in the trials the Greater Baltimore is given preference and is recommended as a good canning type.

Market Varieties. It is assumed that there is but a limited demand for a typical market tomato variety. The *Glovel* should prove to be a satisfactory "pink" fruited variety, while *Grothens Globe* as a red fruited sort finds favor. Both have globular fruits and are resistant to wilt.

Glovel. A new variety produced by the U. S. D. A. for the southern grower. At Salisbury the vines were spreading to upright, moderately vigorous. Fruits are pink, of medium size, and are round and solid. The early fruits were rather rough and irregular this season but since other varieties showed a similar tendency it is assumed to have resulted from some environmental factor or factors.

Grothens Globe and Break O' Day. These varieties are similar as regards fruit type, season, and disease resistance. Grothens Globe is much preferred because of its more upright and luxuriant vine. The open-spreading vine of Break O' Day exposes the fruit and severe sun scalding is the usual result.

Scarlet Dawn. An early small fruited variety introduced by Associated Seed Growers. Vine is vigorous and productive but the globular fruits may become undesirably small as the season advances.

Sweet Corn Varieties

The sweet corn varieties have been tested from the canning standpoint and rather complete data have been secured relative to time and rate of maturity, grades, and "cut-off" weights. Table II summarizes three years' data for several yellow and white hybrids in comparison with open-pollinated varieties. All seed stocks were furnished by Associated Seed Growers, Inc.

Yellow Varieties. Mr. Silver, writing in THE CANNER,* tells us that the quality of yellow corn, as a canned product, has long been recognized but prior to 1930 a very limited quantity of yellow corn was packed. With the introduction of the hybrid, Golden Cross Bantam, the practice of canning yellow corn was greatly stimulated and by 1934 about four and one-half million cases of this variety were packed. This was equal to about thirty-one per cent of the total pack for 1934. The following year the pack of Golden Cross Bantam was eight and one-half million cases.

Since the introduction of Golden Cross a great number of yellow hybrids and varieties have been perfected. Golden Colonel, a yellow Country Gentleman was placed in the trials in 1935 and Bantam Evergreen, the golden replicate of Stowell's Evergreen and other yellow varieties, have been grown in small plots for observation.

Golden Cross Bantam. Golden Cross Bantam as a yellow hybrid is outstanding. It is productive as regards marketable ears and cut corn and is well adapted to Maryland conditions. The plants are relatively large, vigorous, and resistant to bacterial wilt. Ears are about eight inches long with ten to fourteen rows of kernals. This hybrid has been decidedly better than the Top Cross in all respects and ranked well with the larger white types in marketable yield. It is recommended for canning or market use.

Golden Colonel. Golden Colonel is an open-pollinated variety which should find favor as a yellow Country Gentleman type. It is very similar to the latter in all respects except the color of the kernal. There has been some difference in yield in favor of the yellow variety.

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*F. S. Silver—CANNER, Vol. 32, pp. 14-15. April 11, 1936.

Table II. Sweet Corn Varieties—Averages for Three Years (1934-1936) Weaver Farm

Variety	Yield as Tons Per Acre		Percent Marketable	Cases† Per Acre	Maturity (da.)	
	Total	Mkt.			50 Percent Silked‡	To Harvest
Golden Cross Bantam	3.29	2.06	79	70	3.9	78
Top Cross Bantam	1.79	1.18	77	43	4.6	76
Country Gentleman 19x9*	2.07	1.67	74	54	5.8	88
Country Gentleman	2.26	1.71	78	51	5.3	88
Country Gentleman 19x24*	2.44	2.25	84	65	4.9	85
Stowells Evergreen	2.78	2.27	84	61	5.7	88
Stowells Evergreen 14x5	2.81	2.30	84	64	4.7	85
Narrow Grain E.	2.43	1.47	72	52	4.5	90
Narrow Grain E. 26x15	2.99	2.51	86	64	4.9	83
Golden Colonel*	2.00	1.93	80	60	5.6	85

*Two-year average.
†21 lbs. Cut corn/case.
‡Days required for one-half of the ears to silk (25-50% silked.)

White Hybrids. Four white hybrid varieties have been grown in comparison to the open-pollinated varieties. Narrow Grain 26 x 15 has been most outstanding. Stowells 14 x 5 has been slightly better than Stowells open-pollinated while one Country Gentleman hybrid 19 x 9 was as a whole inferior to the open-pollinated variety. The other hybrid (19 x 24) was superior to Country Gentleman as regards yield and grade of ears.

Narrow Grain 26 x 15. Narrow Grain 26 x 15 has excelled all varieties in the trials and per cent of marketable ears. This hybrid matures from four to seven days ahead of the Narrow Grain variety and produces large ears, (20 to 22 rows), which are rather strongly tapered. The husks are fairly heavy and the cob is large and as a result the proportion of cut-corn has been slightly low. This hybrid is decidedly better than the open-pollinated variety and is preferred when a Narrow Grain type is desired.

Stowells Evergreen 14 x 5. Stowells Evergreen 14x5 has been a trifle more productive than the open-pollinated variety with ears of about the same quality. In season it is about three days early and silking is more uniform. Ears are about nine inches long with sixteen to eighteen rows of kernals. This hybrid is apparently more productive than Stowell's but the difference has not been great enough to merit an unconditional recommendation for this hybrid.

Country Gentleman 19 x 9. Country Gentleman 19 x 9 has been tested two seasons and failed to be equal to open-pollinated Country

Gentleman in many respects. When grown in Maryland two objectionable features are evident—looseness of husks and a tendency for lodging.

In time of maturity and uniformity of the silking of the ears, this hybrid is approximately equal to Country Gentleman and it is doubtful that it is as productive in the yield of ears.

Country Gentleman 19 x 24. Country Gentleman 19 x 24 is a different type of hybrid in that the plants are stronger with less tendency for lodging. In comparison with the other Country Gentleman types it is earlier (about three days), silks more uniformly and the ears and kernels are larger. It has been productive as regards marketable ears and cut-corn and on this basis is desirable for Maryland planting.

Cucumber Varieties

Trials with cucumbers and other truck crops have been conducted on the Adkins farm near Salisbury, Maryland, during the seasons of 1935 and 1936. The yield data secured with cucumbers in 1936 are given in Table III. The season was rather unfavorable and the quality of the crop was relatively low.

On the basis of quality and yield of fruits the varieties A. C. Clark's Special and Woodruff's Hybrid are considered to be the best of the varieties tested. Earliest of All and Klondike apparently are productive but their fruits are undesirably short and lacking in color. Greenbac and Straight-8 ranked low in marketable yield while Burpees Fordhook was relatively low in yield of marketable fruits with some tendency for poor color.

Table III. Cucumber Trials—Salisbury—1936

Variety	Yield / Rows* (lbs.)			Bu. Per† Acre Marketable	Avg. Size (lbs.)	Days to 50 Percent Harvested
	Marketable	Total	Percent Marketable			
Klondike	160	393	41	144	.49	74
Clarks Special	153	281	55	138	.52	76
Earliest of All	145	349	42	131	.52	74
A. C.	124	228	54	112	.55	77
Woodruff's Hybrid	124	248	50	112	.55	76
Fordhook Famous	117	322	36	105	.56	74
Straight-8	91	252	36	82	.52	74
Greenbac	83	305	27	75	.64	73

*Area approximately 1/45 acre.

†Calculated on the basis of 50 lbs. per bushel.

A. C.—from Abbot and Cobb Seed Company, probably has the best quality fruit of all the varieties tested and is a very desirable slicing

type as regards shape and color. The total yield was low this season but since the fruits were of relatively high grade a satisfactory marketable yield was obtained.

Clark's Special and Woodruff's Hybrid. These varieties are very similar in fruit type with some indications that better color is found in those of the latter variety. These varieties graded out a relatively high per cent of marketable fruits and matured in season with A. C. and two to three days later than the remaining varieties.

Klondike and Earliest of All. These varieties are almost identical in fruit type with short blunt-ended cucumbers which tend to become yellow prematurely. Apparently they are very productive but cannot be very strongly recommended for market use in Maryland because of their fruit type.

Straight-8. Straight-8 from Ferry-Morse ranked low in marketable yield this season. Some shapely, well colored fruits were produced but in all, the marketable portion was small. On the basis of two years of trials and observations, this variety does not seem promising for production in Maryland.

Greenbac. Greenbac was tried for the first time in 1936 and produced large fruits which developed satisfactory color. They present a good appearance and should go well in the markets. In total yield this variety ranked fourth, but due to the production of a great number of mis-shapen or otherwise defective fruits it was lowest in marketable yield. Further trial is necessary to determine whether this is characteristic of the variety or was just a seasonal response.

Fordhook Famous. Fordhook Famous was quite productive in total yield, but graded out a relatively low per cent of marketable fruits. The cucumbers of this variety were medium to large in size and medium-green in color. The performance this season was not outstanding and at present the variety could not be recommended very highly.

Cantaloupe Varieties

The varieties, Hearts of Gold and Hales Best (No. 36) have been used as standard types for comparison with the other varieties. The 1936 season was not especially favorable for the cantaloupe crop and relatively small melons were produced as indicated in Table IV.

The trial did not disclose any new varieties superior to Hale and Hearts of Gold for shipping purposes. Margold was good, especially as regards size of melons, and is decidedly better than Pink Meat. Bottomly is recommended for local market use.

Table IV. Cantaloupe Trials—Salisbury—1936

Variety	Yield / Row*		Average Weight (lbs.)	Days to 50 Percent Harvested
	No. Melons	Lbs. Melons		
Hearts of Gold	209	318	1.5	95
Pink Meat	190	295	1.6	94
Superfecto	153	248	1.6	94
Bottomley	159	300	1.9	93
Honey Rock	135	254	1.9	94
Hales Best	125	275	2.2	93
Margold	124	287	2.3	94
Weaver Special	97	192	2.0	95

*Area approximately 1/45 acre.

Honey Rock (*Sugar Rock*). This variety is relatively new and originated in Ohio from the hybridizing of three varieties—the Irondiquot, Honey Dew, and Champlain. The melons are of fair size, almost round, with a gray-green skin beneath a sparse but coarse netting. The flesh is medium thick orange-salmon in color and of good quality. The fruits should stand shipment for moderate distances. The type is not very well fixed in this variety at present and it is desirable to make further trials to determine its real value in Maryland.

Margold. This variety was grown from locally grown seed and was new to our trials this season, but it has been grown for some time in Wicomico County. The melons are sutured, with a golden skin, well covered with refined netting. This variety is decidedly superior to Pink Meat, which it roughly resembles.

Weavers Special. This is a "white" type possessing some Honey Dew characteristics. Fruits are round, free of sutures with a light golden skin. Flesh is thick, smooth and salmon in color. The rind is thin but apparently tough enough to stand shipping. The yield of fruits during the last two years indicate that this variety is relatively unproductive under Maryland conditions.

Superfecto. This variety resembles Hales to some extent, with fruits which are slightly oval in shape and a trifle smaller. It has a degree of mildew resistance and has shown some promise in the trials.

Lima Bean Varieties

The trials were conducted at College Park and Salisbury this season. The variety Early Wilson was added to the test this year while Early Giant, New Wonder and Dreers were carried over from the previous trial.

As indicated in Table V, the variety Early Wilson was most productive at Salisbury followed by Fordhook and Burpees Improved. At

College Park the varieties Early Giant and Fordhook excelled, followed by Dreers and Early Wilson. (Dreers *Pole* was mistakenly planted for Dreers *Bush*).

Table V. Lima Bean Trials—Salisbury and College Park (Weaver Farm)—1936.

Variety	Salisbury			College Park			
	Total Yield		Pods Per Pound	Total Yield		Pods Per Pound	Percent Shelled Beans
	Plot* (Lbs.)	Acre (Bu.)		Plot* (Lbs.)	Acre (Bu.)		
Early Wilson	13.5	204.	35	7.20	121.	66	33
Fordhook	10.1	153.	26	8.35	140.	75	28
Burpees Imp.	10.1	152.	29	.....	.....	.....	.....
New Wonder	8.3	125.	45	5.85	98.	66	30
McCrea	6.1	92.	59	2.90	49.	95	27
Dreers (Pole)	7.9	119.	48	7.95	133.	68	42
Early Giant	.....	.....	.....	8.21	137.	68	36
Henderson's	.....	.....	.....	6.70	112.	142	38

*Difference required to be significant:
(1). 2.01 lbs. Plot at Salisbury—30′.
(2). 0.71 lbs. Plot at College Park—27′.

Early Wilson. This variety, from George Tait and Sons, is a new, large podded type which appears to have some promise in this section. Seeds are large, medium plump to slightly flattened. Plants are large and vigorous. It is recommended that this variety be given a limited trial in commercial production.

Early Giant. This variety, from Hendersons, is similar to Early Wilson in pod and seed characteristics. It has been quite productive in two trial years and should be tried in comparison with Fordhook on a commercial scale.

New Wonder. New Wonder is a Burpee type with large, strongly flattened seeds. It performed fairly well in 1935, but during the past season was not so fruitful and cannot be highly recommended at present.

McCrea. McCrea was introduced by the McCrea Seed Company of California. It is a small Fordhook as regards pod type. Pods are about half as large as those of Fordhook and the seeds are plump and fit tightly in the pod making shelling difficult. This variety is entirely unproductive in Maryland and certainly could not be recommended for market purposes.

Snap Bean Varieties

Earliness in snap beans is of prime importance to growers of Market beans and because of this fact the choice of varieties is limited to relatively few. The Bountiful variety is widely grown and this standard was grown in comparison with such varieties as Sure Crop Wax, Giant Stringless Green Pod and the New Stringless Black Valentine. Two mosaic resistant Refugee types were also grown in the trials.

As indicated in Table VI, the varieties Bountiful and Giant Stringless were most productive, this season, followed by Stringless Valentine and Sure Crop Wax. The Refugee types were less productive and fully two weeks late in time of harvest.

Table VI. Snap Bean Trials—Salisbury—1936

Variety	Yields per:		Pods per Pound	Days to Mid-harvest
	Row (lbs.)	Acre (bu.)		
Bountiful	108	252	64	67
Giant Stringless	104	243	84	68
Stringless Valentine	98	229	75	67
Sure Crop Wax*	87	203	67	68
Idaho Refugee	66	156	90	79
Wisconsin Refugee	45	106	117	85

*Bountiful Wax.

Stringless Black Valentine. This variety represents a new improved Valentine variety introduced by Associated Seed Growers, Inc. This type was as early and practically as productive as Bountiful. Pods are round, green, tender, and attractive. This variety is widely grown in the south and should find some use in Maryland.

Bountiful. The Green-pod was more productive and about a day earlier than the wax-pod or Sure Crop. These varieties mature in about fifty days although this year the first harvest was delayed about ten days by lack of moisture. Pods of the Green type are large, much flattened, and of good quality, while those of the wax variety are thick-flat, stringless, and of fine texture.

Giant Stringless Green Pod. This is a productive variety widely planted for canning purposes in Maryland. Pods are tender, stringless, and of medium size. Marked indentations in the pod between the seeds serve to "trade mark" this variety. In season, this variety is a few days later than Bountiful and its use is limited principally to canning.

Refugee Strains. Two mosaic resistant strains were grown, the *Idaho Strain* developed by Dr. Pierce, and the *Wisconsin Strain* introduced by Dr. J. C. Walker. Both strains are mosaic resistant and their fine pods make them excellent for canning purposes in regions where climatic conditions are favorable.

They are too late for extensive use in market production and apparently are not adapted to the Maryland environment.

Watermelon Varieties

Fusarium wilt is becoming a factor that cannot be disregarded in watermelon production in Maryland. The area of wilt soils is increasing with time and ordinary cultural practices are ineffective in checking this disease. Many Fusarium diseases are effectively controlled by use of resistant varieties and in the case of watermelons varieties, a great deal of progress has been made in the development of wilt resistance. Several resistant strains and varieties have been tested in our plots at Salisbury during the past two years.

The season of 1936 was not very favorable for the crop beginning with a drought early in the season which delayed the time of maturity considerably and also caused an irregular emergence of the plants. Two harvests were made in order to permit maximum development of all fruits. Table VII presents the yields and average sizes of the melons. On the basis of number of melons the varieties Florida Favorite and Kleckleys No. 6 ranked first, followed by Thurmond Grey and Stone Mountain.

Table VII. Watermelon Trials—Salisbury—1936.

Variety	No. of Melons*	Av. Wt. Lbs.		Melons Per Acre†
		First Harvest	All Melons	
Florida Favorite	92	17.4	16.5	1040
Kleckley's No. 6	85	19.0	17.8	961
Thurmond Grey	72	20.4	20.4	814
Stone Mountain	73	19.7	18.4	825
Tom Watson	67	19.5	17.2	757
Pride of Muscatine	66	18.2	16.0	746
Stone Mountain No. 5	65	17.5	16.6	735
Big Boy	59	17.9	16.2	667

*Yield from 60 hills planted 8'x8'.
†Yield calculated to acre of 680 hills.

Resistant Varieties:

Kleckley's No. 6. This variety was supplied by Mr. Layton of Iowa State College and appears to be a good Kleckley type and was productive with fruits of good size this season. This variety certainly

deserves further trial in Maryland and it appears desirable to determine its reaction to handling and shipping.

Stone Mountain No. 5. This is also from Iowa and, in the main, is a typical Stone Mountain Strain. Its performance this season was not as gratifying as was that of the resistant Kleckley type but it is desirable to continue the work with this variety. A resistant Stone Mountain would be a valuable acquisition to our variety list.

Pride of Muscatine. This variety was also originated in Iowa and is of the Kleckley type. This variety has been grown in the trials for two years and has been found to be lacking in fruit quality to some extent. During the past season there was a preponderance of misshapen (gourd-shaped) fruits produced.

Other Varieties:

Florida Favorite. This variety is a long, medium large, fruited type. Melons are dark green with a light stripe. The rind is moderately tough and stands handling and shipping to nearby markets. Ordinarily the fruits of this variety average about 25 pounds. With the adverse season experienced in 1936, the average was much less than this.

Thurmond Grey. This is a large, long, grey-green variety and a good shipping type. This variety gave a good performance this season. Fruits were largest at about twenty pounds, although thirty to forty pound melons are expected under favorable growing conditions.

Tom Watson. This is the favorite shipping type. Fruits are long green, with faint veining or striping, and are large when grown under favorable conditions. *Big Boy* is a typical Tom Watson melon from the D. Landreth Seed Company. The skin color is green but perhaps a shade lighter than that of the Tom Watson.

Sweet Potatoes

Sweet potato tests were conducted at College Park and at Salisbury in 1936. Mr. J. H. Beattie of the U. S. D. A. kindly furnished stock for a number of the varieties and also for several seedling lines that they are studying in their work at the Beltsville Station. Stocks of Maryland Golden and Maryland Dry White were secured from Mr. Thomas H. White.

There was some difference in the way that the varieties performed under the conditions of the two locations. As a whole the Jersey types were best on the lighter soil on the Eastern Shore, while at College Park better yields were secured with the Nancy Hall and the Southern Queen types. It should be noted that the variety Porto Rico did well at either location. (See Table VIII).

Table VIII. Sweet Potato Variety Trials at Salisbury and College Park—1936.

Variety and Group	Salisbury				College Park		
	Lbs. Total	Row Market-able	Percent Market-able	Bu./Acre Market-able	Pounds Plot*	Percent Market-able	Bu./Acre Total
A. Jersey:							
1. Maryland Golden	206	188	91	252	19.6	90	158
2. Maryland Dry White	82	72	88	96	21.7	89	175
3. Big Stem Jersey	145	129	88	172	.....	.....	.....
4. Yellow Jersey	89	52	58	69	13.8	68	106
5. Vineland Bush	115	97	84	130	22.0	86	178
B. Spanish:							
1. Porto Rico	133	118	89	157	41.8	91	337
2. Mameyita	86	79	91	106	.....	.....	.....
3. No. 10412	32	26	81	34	.....	.....	.....
4. Pierson	82	69	85	92	32.9	94	266
C. Florida:							
1. Nancy Hall	69	62	90	82	35.8	91	289
D. Southern Queen:							
1. No. 85986	78	69	89	92	.....	.....	.....
2. No. 64377	72	62	86	82	.....	.....	.....
3. No. S-312	67	55	82	74	31.9	93	257
E. Belmont:							
1. No. H7442	62	47	76	63	37.0	85	298

*Difference required for significance—7.0 lbs./plot.

*Maryland Golden Sweet.** This is a new variety of the Jersey group which originated in 1928 as a bud variation or bud sport of Big Stem Jersey. Mr. Thomas H. White of the Maryland Experiment Station found the original plant and introduced the stock to the Maryland growers. Mr. W. P. Hotton of Wicomico County, who has done a great deal to develop this variety, is planting a very extensive acreage in sweet potatoes and is growing Maryland Golden Sweet exclusively. The roots of this variety are readily distinguished from other varieties by the deeper salmon gold color of the skin. The flesh is of salmon color, moist, and of very pleasing quality when cooked.

Maryland Dry White. This is also a Big Stem type developed by Mr. White, originating as a bud sport. This mutation is the reverse of that in the case of Maryland Golden, in that the skin and flesh color of the root is lighter in color and that the cooked flesh is extremely dry. This variety does not appear to be as promising as the Golden variety and is recommended only when a very dry type is desired.

Seedling Numbers 85986, 64377, and S-312. These are of the same general type as the Southern Queen variety. Roots have white skin and cream to yellow flesh color, and are moderately moist to moist when cooked. The yields of these seedlings were not large on the Eastern Shore, but the S-312 was very productive in the test at College Park.

Mameyita. This is a variety of the Spanish group and is similar to Porto Rico in many respects. Roots are of deeper color and probably more regular. Flesh is deep salmon, splashed with red and cooks to a deep orange. The cooked quality of this variety is excellent.

No. 10412. This variety produces roots with a purple skin and light flesh color. It belongs to the Spanish group, with foliage which resembles the Porto Rico variety.

No. H 7442. This is a seedling of the Belmont group and is characterized by deeply divided leaves. Roots are pink on the outside, with light-salmon flesh color. Cooked flesh is orange-yellow and appears to be of fair quality. Yield was very good at College Park.

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*White, T. H. Report of Maryland Vegetable Growers' Association, 1933, pp. 50-54.

THE WHOLESALE FRUIT AND VEGETABLE MARKET IN BALTIMORE CITY

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It would be impossible to discuss even briefly all phases of the wholesale markets in Baltimore in the time allotted to me today. Therefore, I shall confine the greater part of my discussion to the effects of the motor truck on marketing and the inadequacy of the markets to handle truck shipments.

The Experiment Station began a very comprehensive study of the wholesale fruit and vegetable markets of Baltimore City in the fall of 1935. During that fall and winter, Mr. George Lachar completed a part of this study. His work was confined to the Marsh Market only. In March of last year (1936) we began working on a study of the other Wholesale markets. At present the latter study is nearing completion.

The purpose of these studies is to determine the volume of produce handled by wholesale markets in Baltimore, the origin of this produce and its ultimate distribution. In addition, we have obtained considerable general information, all of which will be useful in determining the problems that exist in marketing to both the farmer and middleman, and what steps or measure should be taken to effect a solution.

Before going into the discussion on motor trucks it might be well to spend just a few minutes in getting a birdseye view of the different wholesale markets in Baltimore, an idea of the particular function of each and its methods of operation.

Produce arrives in Baltimore by three different methods, namely: Rail, boats and trucks.

The Pennsylvania Railroad Produce Terminal, located a few hundred feet north of North Avenue and East of Druid Hill Park, handles the major portion of the produce arriving by that Railroad. Most of the produce is handled here by middlemen who operate within the terminal. Some of these men operate as commission men, some as wholesalers, some as brokers and some do what might be known as a mixed business, that is, wholesale, commission, brokerage and joint account.

The B. and O. Produce Terminal is located at Howard and Camden Streets. Most of the produce arriving at this terminal is fruit from Florida, California, and the Pacific Northwest, and the major portion of it is sold by the fruit auction. Auction sales are handled in the following manner: The shipper consigns his car or cars to a representative in Baltimore who arranges to have it sold at auction. Cars to be sold at auction are unloaded and the products arranged on the floor of the produce terminal in what are known as blocks and lines.

A block is an entire carload of produce and a line is all of the produce in that car of one grade and size. The produce is unloaded at an early hour of the morning and arranged in these blocks and lines for inspection by the buyers. An auction catalogue is then made up showing the grade, size and number of packages in each line. At a later hour in the morning, usually 7 a. m. to 9 a. m., the buyers are allowed to inspect the produce. At a definite hour, usually 9 a. m., the buyers all congregate in another room and bid on the produce in somewhat the same manner that you would bid on property at a country sale. Bidding is usually spirited and sales are made in rapid succession. There is much to be said for and against this method of sale, which time will not permit this morning.

Boat arrivals may be divided into three groups, namely: Arrivals at the banana wharves, long dock, and the Commission Wharves. The bananas arrive at three different wharves and the auction handles all sales made in Baltimore; however, there is a large amount, 25%-70% of each cargo that is loaded on freight cars from the boats and shipped far and wide. I will pass around this picture that appeared in the Baltimore Sun last year which shows the loading of freight cars for shipment to distant points.

The produce arriving at long dock is mostly Eastern Shore produce that comes up the bay in bug eyes and other miscellaneous small water craft. Sales here are made between the boat operators who may or may not be farmers and the different buyers. I will pass around this picture which also appeared in the Baltimore Sun last summer, showing sales at Long Dock.

Produce arriving at the other wharves is usually sold on commission by Baltimore Commission men.

Most of the produce arriving by truck goes either to Camden or Marsh Market. I suppose everyone here is well acquainted with these two markets and the methods by which sales are made. I have two tables showing the volume, origin, and distribution of the produce sold at these markets that I think will be interesting.

Table 1. Estimated Origin of Fruits and Vegetables Handled at Marsh and Camden Markets, 1935.

Origin	Marsh Market Carloads[1]	Marsh Market Percent	Camden Market Carloads[1]	Camden Market Percent
Direct from country points by truck	11,406	100.00	6,075	37.44
Maryland-grown produce	8,585	75.27	1,482	9.13
Out-of-state produce	2,821	24.73	4,593	28.31
Pa. R. R. Produce Terminal	.....	.....	2,014	12.41
B. & O. Produce Terminal	.....	.....	283	1.74
Boat wharves	.....	.....	1,185	7.30
Fruit auction	.....	.....	1,152	7.10
Banana auction	.....	.....	1,412	8.70
Marsh Market	.....	.....	3,515	21.66
Camden Market	.....	.....	445	2.74
Express and Misc.	.....	.....	148	.91
Total	11,406	100.00	16,229	100.00

[1]Boat and truck shipments converted to carloads.

Table 2. Estimated Distribution of Fruits and Vegetables Handled at Marsh and Camden Markets, 1935.

Destination	Marsh Market Carloads	Marsh Market Percent	Camden Market Carloads	Camden Market Percent
Baltimore buyers	9,696	85.01	9,638	59.39
Canners	4,953	43.42	.....	.....
Camden Market	3,515	30.82	445	2.74
Jobbers	600	5.26	1,674	10.32
Retail stores and markets	.....	.....	5,325	32.81
Chain stores	428	3.75	964	5.94
Other Baltimore buyers	200	1.76	1,230	7.58
Out-of-town buyers	1,710	14.99	6,591	40.61
Total	11,406	100.00	16,229	100.00

The motor truck as a means of getting fresh fruits and vegetables to market is the baby of yesterday that grew into a man overnight.

We have no statistics to show the trend in shipments of fruits and vegetables to Baltimore. But, we do have estimates to show the volume and proportion that arrived by truck in the year 1935.

Table 3. Estimated Receipts of Fruits and Vegetables in Baltimore City By Wholesale Dealers, 1935.

Method of Movement	Receipts Carloads[1]	Percent
Truck receipts	17,481	48.46
Marsh Market	11,406	31.62
Camden Market	6,075	16.84
Boat receipts	9,032	25.04
Bananas	5,267	14.60
Other fruits and vegetables	3,765	10.44
Rail receipts	9,559	26.50
Total	36,072	100.00

[1]Boat and truck receipts converted to carloads.

The truck has many advantages. By shortening the time that it takes to move perishables from the farm to the market thousands of dollars can be saved. There is no doubt that trucks can claim this accomplishment, excluding flat tires and interference from culverts and telephone poles. This applies to hauls of 1000 miles or less and not to the far western shipments.

A large number of growers and shippers find it inconvenient or even impossible in some cases to load a whole car at once. The truck serves this group to the best advantage.

Trucks can haul produce direct from the farm to the market and save time and expense that would be necessary if the same produce moved by rail.

In recent years with the improvements in highways, greater efficiency in gas consumption together with other improvements in trucks, the truckers have been able to compete with the railroads by charging lower rates, especially on short hauls for which the railroads charge a higher rate per ton mile.

This is only one side of the picture. Both Camden and Marsh markets were developed at a time when most of the produce arrived on boats. During that period these markets served their purpose very well. Today many changes have been made. With the exception of banana shipments, the boats bring a negligible proportion of the produce. The areas of production have shifted. The population of Baltimore City has been continually increasing but the facilities of these markets have remained practically the same. Therefore, the present facilities are inadequate and inefficient. The increased use of trucks in shipping produce to market has created many problems. When a large percentage of the produce shipped to a given market

arrives by truck, it is impossible to determine the supply for the day previous to the opening of sales, under present regulations. Therefore, the trade has become more speculative and the buyers more hesitant in making purchases for fear of a demoralized market due to late and new arrivals by truck. I will try to explain this statement more fully with an illustration. Let's assume that a load of good quality strawberries arrives in the market about 1 a. m., or an hour before the opening of sales. At two o'clock the sales begin and this is the only load of berries in the market. These berries will bring a rather high price, let's say about $4.25 per crate, because there is a small supply on the market. The buyers will show plenty of interest but will be hesitant in buying; however, by 3:30 a. m. the commissionman will have succeeded in selling the greater portion of this load. At this time three more loads of good quality berries arrive. The bottom will immediately fall out of strawberry prices. The balance of the load that has been selling for $4.25 per crate will be sold for about $2.25 per crate, as well as the late arrivals. Let's stop for a moment and analyze this situation. The buyer who bought early is stuck (slang phrase used quite extensively among men in the produce trade) because he must sell his berries in a retail market or store in competition with the man that bought later at $2.25 per crate. The early buyer, if he is human, and most of us are, is going to feel that the commissionman overcharged him and he will try to make up this loss at some other time by hook or crook. To make matter's worse, let's assume that these berries were grown and shipped by four farmers: Jones, Smith, Brown and Day, who are neighbors. Jones' berries arrived early and he received a good price, Smith's, Brown's and Day's berries arrived later. When Smith, Brown and Day discover that Jones received almost twice as much for his berries that were of similar quality to their berries they are going to feel that the commissionman has pocketed part of their money. This condition does not exist every day, nor is it common for the more stable produce like potatoes, apples and onions, but it is a rather common occurrence for the mort perishable products like berries, tomatoes and the leafy vegetables that cannot be stored or carried over for a more favorable market. You might ask why wouldn't this condition exist if these berries had been shipped by rail. In the first place, if these shipments had been made by rail the trade would have known in advance through the Market News Service that these shipments were due to arrive several hours previous to their arrival, and the price would have been stabilized accordingly.

In the second place, a carload of berries can be held over several days for a better market due to the better refrigeration methods used for rail shipments.

Truck arrivals also have a tendency to make the market price more unstable from day to day than do rail shipments. The Market

News Service reports daily shipments and loadings by rail and if a shipper sees that a certain market is going to be oversupplied and another market undersupplied he can divert or reconsign his shipments to the market with the smaller supply, thus tending to stabilize prices in both markets. This is not possible with truck shipments, as no one knows the amount of produce in transit by truck until it arrives in the market. If the trucker sees that the market is oversupplied when he arrives it is usually too late to make another market that day and tomorrow the other market may be glutted. Therefore, his only choice is to take the price offered that day.

Both Camden and Marsh Market are terribly congested. At Marsh Market during the peak season the market proper can handle only 20 to 30 per cent of the total arrivals. The other trucks must park on some nearby street or alley until the truckloads in the market have been sold and move out. The Market proper can accommodate approximately 126 trucks. During the peak season the daily arrivals range between 400 and 600 truckloads. In Camden Market it is not unusual to have traffic jams several times a day that hold up traffic for a whole city block from ten to fifteen minutes. It is often necessary for a man to wait for an hour or more to find a vacant space to load or unload his produce.

With all the problems that have accompanied the increased use of trucks, we have good reasons to believe that the trucks will continue to haul the same if not a greater proportion of the produce shipped to Baltimore. About 58 per cent of the present truck arrivals, or the equivalent of 10,067 carloads, represent Maryland grown produce. The balance of the truck shipment, 7,414 carload equivalents, originate in producing regions along the Atlantic Coast, at a distance of 100 to 1,000 miles from Baltimore City. There is no doubt that the Maryland grown produce will be shipped by truck, and it is doubtful if the railroad will be able to compete to any great extent with the truck on hauls of 1,000 miles and less. However, the railroads have just recently lowered rates and they are now experimenting with light and faster trains. The railroads are also experimenting with a flat type of car that carries several removable compartments. The idea is to make less than carload shipments possible and easier to handle. These improvements may help to divert some of the shipments back to the railroads.

The proper course for the farmer and middleman should be toward solving the problems that have accompanied trucking. The first and most important improvement would be to develop some method of determining the supply on the market previous to the opening of the sales hour. Some of the middlemen in Baltimore feel that this could be done by consolidating all truck shipments at one place and requiring all trucks to arrive before a definite hour, previous to the opening of sales. Others feel that the daily price could be stabilized by

shortening the sales period through an agreement among the members of the trade to start selling at a definite hour and to stop sales at a definite hour. Others think that both the daily and day to day price could be stabilized if the Market News Service would operate truck recording stations at strategic points along all the important highways of the country to record all movement of fruits and vegetables and destination of these shipments.

The consolidation of all trucking at one place would require the expansion of either Marsh or Camden Market or the construction of a new Market at some other location. Any of these improvements would necessitate the expenditure of a large sum of money and it is doubtful if the co-operation of the entire trade could be obtained for a project of this kind. The shortening of the sale period would help to stabilize the daily price but it would also further congest these markets that are overcrowded at present. Truck recording stations operated along the main highways of the country would not be effective in recording Maryland grown shipments for the Baltimore Market, which constitute 58 per cent of the total truck shipments at present.

If truck shipments continue to increase, and they probably will, something will have to be done to relieve the traffic congestion in both Camden and Marsh Markets. The congested condition of Camden Market was improved somewhat last summer when Camden Street was made a one-way street, but the possibilities of further police regulation are nearly exhausted.

About the only satisfactory and permanent improvement that can be made to relieve traffic congestion will be to either enlarge and improve the present markets or relocate at some other place where there is plenty of space. Either of these improvements will be costly. If the trade should decide to relocate at some other place there are several firms in the Camden Market that own their property. This property would probably decline in value, thus causing these firms to take a loss that could not be recovered through the increase in business at a new location. However, by relocating on cheaper land the cost of building a new market would not be as great as the enlarging and improving of the present market locations. If the trade should decide to enlarge and improve the present markets additional land would have to be purchased in areas where land values are high. The present streets and sidewalks in Camden Market would need to be widened, necessitating the tearing down of most of the old buildings and the construction of new buildings. If Marsh Market were extended eastward the Fallsway would have to be covered. Considerable difficulty might arise in persuading the present owners of this extra space to sell.

Any improvement of this nature would of necessity have to be made and sponsored by the people in the wholesale trade. The

facts which the Maryland Experiment Station has been gathering should be very valuable in indicating to the trade some of the chief problems.

Baltimore is not the only city that is faced with serious marketing problems. The Department of Agriculture published a report on the Philadelphia market recently, showing the result of the study conducted by the Department and the Experiment Stations of New Jersey, and Pennsylvania. This report shows that the Philadelphia markets have also become inadequate and inefficient in the economical distribution of perishable farm produce.

In addition to the discussion on trucks, I would like to make a few statements regarding the integrity of the commission man as an agent of the farmer. In the past the commission man has been accused of many dishonest practices. Today this condition has changed. The Perishable Agricultural Commodities Act was passed by Congress and went into effect on December 12, 1930. This act is designed "to suppress unfair and fraudulent practices in the marketing of perishable commodities in interstate and foreign commerce." This Act also requires the licensing of Commission Merchants, dealers and brokers. Any dealer found guilty of violating this Act is subject to a fine or imprisonment and the loss of his license. This Act has received the support of most of the dealers and it is an assurance to the farmer that his produce will be handled by honest and reputable dealers in the wholesale markets.

In our study of the Baltimore wholesale markets we examined the books and interviewed a large per cent of the dealers in the markets. We found them to be honest and willing to assist or co-operate in any way possible to secure for the farmer a better price for his produce.

USE OF ROTENONE AND PYRETHRUM IN THE CONTROL OF VEGETABLE INSECTS

By DR. E. N. CORY
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University of Maryland

Two insecticides have recently come into considerable prominence. One is an old insecticide that has been greatly improved, and the other is a comparatively new material formerly used as a fish poison, by aborigines, the active principle being known as rotenone. Pyrethrum is the ground flowers and buds of a daisy-like chrysanthemum that grows wild in central Europe, particularly in Dalmatia. You are undoubtedly familiar with it in what is generally termed insect powder, used as a household pest remedy. It has also been used on crops for a number of years, but recently new methods of grinding

the flowers and extracting the active principles which are known as pyrethrins, have been developed and the use of this material as a spray and as a dust has greatly increased. It is sold now under many trade names in solutions combined with soap and other spreaders, and as a dust combined with talc and other inert carriers. Baltimore is one of the principal centers of grinding and marketing of this material. The McCormick Sales Company developed the first alcoholic extract of pyrethrum, and this material was given extensive tests under a fellowship at the University of Maryland. This material is now known as Red Arrow. Other companies manufacture various other sprays such as Evergreen and a pyrethrum product, combinations of pyrethrum and rotenone. The McCormick Sales Company has also developed a dust known as Black Arrow, consisting of ground pyrethrum and an inert carrier in various modifications.

Rotenone occurs in a number of plants such as Derris, the principal sources of which are the Philippines and the Dutch East Indies, and from Cubé from South America. Associated with rotenone in these plants are three other poisons, degulin, tephrosin and tubatoxin. The most active of these poisons seems to be rotenone, and most sprays and dusts carrying these insecticides are standardized on the basis of the rotenone content. There are many brands of sprays and dusts bearing this insecticide, some are a combination of pyrethrum and rotenone, usually with a suitable spreader and some are combinations of inert dusts, sulphur and rotenone.

I find that vegetable growers in general do not know, or realize that there are definite tolerances allowable on vegetables, just as there are on fruits in regard to lead arsenic and fluorine residues. Growers who have been in the habit of dusting cabbage for a life time, with arsenic in some form, have failed to realize that their product may be confiscated after it goes to the market if it shows any considerable quantity of spray residue and upon analyses if arsenic, lead or fluorine are present in excess of announced tolerances it is likely to be destroyed, and the grower has no recourse. Several examples of this sort occurred last year. It is perfectly possible to treat crops in the early stages of their growth with arsenic, but if this poison is used at later stages of development, there is quite likely to be sufficient spray or dust left on the crop to cause its confiscation. Fortunately, adequate substitutes in pyrethrum and rotenone are available to take the place of the other poisons, and every farmer should familiarize himself with proper methods of using the two materials.

Owing to the fact that both pyrethrum and rotenone loose some of their efficacy when exposed to the elements more frequent applications are necessary than was formerly the case with the use of poisons. The insects that normally attack cabbage and other cruciferous crops can be controlled by pyrethrum dusts or sprays or by

rotenone dusts or sprays. The grower should, and can depend upon the manufacturers to furnish him with dusts that are fresh and of adequate pyrethrin content so that approximately 10 to 15 pounds, per acre, will be adequate to kill those insects that are hit. Rotenone dust should have at least one-half of 1 per cent, and preferably three-fourths of one per cent of rotenone. When used at the rate of 10 to 15 pounds per acre, good results can be expected in the control of most insects. As sprays, the commercial product should be utilized as recommended by the manufacturer, as in most cases the exact concentration has been worked out and an adequate spreader combined with the spray as it is offered to the public.

The Mexican bean beetle can be controlled satisfactorily with the use of rotenone sprays or dusts, but like all other applications for the control of this pest the material must be placed on the undersides of the leaves. The material may be used satisfactorily in spot dusting on the early crop, but for later crops complete dusting of the field will be necessary in most cases. Incidentally, a large number of bean beetles went into hibernation last fall and a heavier infestation of early beans will probably ensue this spring than we had last year, so that growers should be on the alert to treat their early crops, and should prepare to plow down all crop remnants promptly after the last picking, after first having disked the field in one direction. A wide bottomed plow should be used so that complete coverage will be obtained, otherwise the beetles will emerge from the ground.

Recent experiments have shown that rotenone in combination with a sulphated alcohol spreader is very effective in the control of the pea aphis. We have been conducting tests for many years with nicotine and soap in Garrett County, together with minor tests of other materials, none of which has proved satisfactory, except the rotenone, and we are now recommending either the use of nicotine and soap or rotenone plus the sulphated alcohol spreader.

Rotenone has given excellent results in the control of the cucumber beetle, the squash bug, Harlequin cabbage bug and thrips.

Pyrethrum has given best results where there is a combination of aphids and other insects, because rotenone is not generally satisfactory as an aphicide, except on the pea aphis. I think I mentioned to you last year about the washing of spinach in pyrethrum, followed by a cold water wash to kill and wash off aphids adhering to spinach.

I cannot emphasize too strongly the necessity for a substitution of pyrethrum and rotenone, for the old time applications of arsenate of lead, Paris green etc. If you would be insured against the confiscation of any of your crops, use these materials in the later stages of growth of your crops, particularly those in which the parts dusted or sprayed are used for food.

Second Session

Thursday, January 14, 1937

SUMMARY OF SEED POTATO STUDIES IN MARYLAND

By R. A. JEHLE
Specialist in Plant Pathology, University of Maryland
Extension Service and Experiment Station

The potato industry is very important in Maryland. In 1935, 3,135,000 bushels of potatoes were grown on 33,000 acres representing a farm value of almost two million dollars. The success of the potato industry depends largely upon the use of healthy seed stock of varieties suitable to the climate in which they are grown and to market demands. Seed potato studies are being conducted to determine how to grow healthy seed potato stock in Maryland which will be most suitable to the potato growers in the State, and to compare it with seed potato stock grown in other localities.

The choice of a suitable variety is one of the first things which should be considered by the potato grower. Studies with all promising old and new varieties are being made in Maryland. For early planting in all parts of the State, the Irish Cobbler variety has given best results. Yields as large as 300 bushels per acre have been obtained in Maryland with the Irish Cobbler variety when good seed was used and weather conditions were favorable, but the usual yields are from 100 to 200 bushels per acre. The Irish Cobbler variety can also be grown profitably as a late crop for seed purposes in all parts of the state at elevations less than 1,000 feet above sea level, and is now extensively grown for this purpose on the Eastern Shore. A new early variety known as the Warba is being tested and has given promising results. In 1935 it did not yield as well as the Irish Cobbler variety, but in 1936 it yielded better than the Irish Cobbler variety. Promising results were also obtained this year with a new smooth white variety originated by the United States Department of Agriculture known as the Houma.

Two new medium late varieties, the Chippewa and Katahdin, both of which were introduced by the U. S. Department of Agriculture, have given promising results. Both are smooth and white with excellent quality. The Katahdin has been found to yield as well as the Irish Cobbler for both early and late planting. It is a valuable variety to plant along with the Irish Cobbler when the potato grower desires to prolong the time in which he harvests the crop. The Golden is a new smooth white medium late variety with a yellow flesh. It yielded well in Garrett County last year, but will have to be tested further before its value for planting in Maryland can be determined.

Of the late varieties the smooth and russet rural varieties have given the largest yields in portions of the State where the elevation is 1,000 to 3,000 feet above sea level. At these elevations yields of from 400 to 500 bushels per acre can be obtained with the smooth and russet rural varieties when good seed is used. Potato growers have recently experienced more trouble with vascular discoloration in the russet rural variety than with the smooth rural variety. For this reason, the smooth rural variety has become the most popular variety at these elevations. Rurals can be grown as a late crop at lower elevations but do not yield as well as some of the other late and medium late varieties, such as the Green Mountain, Katahdin and Up-To-Date. (Gold Coin, White Star, Spencer). When these varieties are used for late planting they must be placed in cold storage from April 1 until about a week before they are planted. Two late varieties, the McCormick and Dakota Red (Jersey Redskin) can be used for late planting when they are kept in home storage during the entire season. However, even with these varieties, and especially with the Dakota Red, better results are obtained when they are kept in cold storage during the summer. For home use and for markets which will accept a red potato the Dakota Red is the best variety for late planting in all parts of the State where the elevation is below 1,000 feet. On account of its susceptibility to virus diseases the McCormick variety is recommended for late planting in parts of the State where the elevation is below 1,000 feet only to potato growers who are willing to produce their own seed in a tuber unit seed plot or who purchase seed grown in such a seed plot.

Maryland potato growers who expect to get good yields of superior quality should use only certified seed, or home grown seed which has all of the requirements necessary for certification. No other kind of seed can be safely used. Tests conducted during the past twelve years in which Maryland certified seed was compared with certified seed grown in other states have proven conclusively that Maryland certified seed is as good or better than certified seed grown elsewhere. Maryland potato growers are advised to purchase northern grown certified seed only when no Maryland grown certified seed is available. The use of uncertified seed grades such as "selects," "seconds from certified seed," etc. is not recommended. When Maryland fall grown Irish Cobbler seed stock is used for planting the early potato crop in parts of the State where the elevation is less than 1,000 feet above sea level, it should be stored at a temperature of approximately 60° F. from the middle of January until it is planted. If it is stored at a lower temperature during this period, it will come up and mature later than northern grown or mountain grown seed.

Maryland potato growers located in parts of the State where the elevation is over 2,000 feet or less than 1,000 feet above sea level can maintain their seed stock permanently if they will plant a tuber

unit seed plot each year and rogue it thoroughly for diseases and mixtures. At elevations below 1,000 feet this seed plot must be planted late enough so that the crop is ready to harvest at approximately the time that killing frosts occur. If no tuber unit seed plot is planted, it is best to grow the crop from Maryland or northern grown certified seed each year.

At elevations between 1,000 and 2,000 feet above sea level best results are usually obtained by planting the crop each year from Maryland or northern grown certified seed. Home grown seed will give almost as good results if it is produced in a carefully rogued seed plot, preferably planted in tuber units. Stock for this seed plot should be renewed each year with Maryland or northern grown certified seed.

Before the potato grower cuts his seed stock for planting he must decide whether it will be profitable to treat it with chemicals to destroy disease organisms which adhere to the surface. In considering seed treatment, the grower must bear in mind the fact that Scab and Rhizoctonia, the two chief diseases for which seed potatoes are treated in Maryland, are both carried over from year to year in the soil as well as on the seed. Seed stock which is free from these diseases may produce a severly diseased crop of tubers if it is planted in soil which harbors the disease-producing organisms. The amount of Scab and Rhizoctonia present on the tubers which are to be planted should make it possible to determine whether it is profitable to treat the seed. If only a small number of tubers contain Scab and Rhizoctonia it is best to discard them and plant the remaining seed without treatment, but if there are many diseased tubers in the seed stock seed treatment is advisable. Soaking the uncut tubers for one to one and one-half hours in a 1-1000 solution of corrosive sublimate, spreading them out to dry and cutting and planting immediately will control both Scab and Rhizoctonia. Treatment with organic mercury compounds (sold under the trade name of improved Semesan Bel) will control Scab but only partially controls Rhizoctonia.

Seed stock should be carefully sorted and all diseased tubers should be discarded. All off-type tubers including elongated pointed and rough potatoes should be rejected since they are likely to have the spindle tuber disease. No tubers with deep Scab spots should be planted and if the seed is not treated, potatoes with Rhizoctonia and Shallow Scab should also be removed. Tubers containing vascular discoloration are likely to carry the Wilt disease and should not be planted. They can be detected by cutting through the stem end since the discoloration usually begins there. Potatoes with other discolorations in the flesh or on the surface should be rejected. Discoloration at the surface may indicate Late Blight and other discolorations may indicate other diseases or weaknesses.

In Maryland potatoes should be rotated with other crops. On account of the presence of the Wilt disease a four-year rotation in which a leguminous cover crop is plowed down is best. The soil should be tested and care should be exercised to keep it slightly acid, otherwise the crop is likely to be scabby. Potato fields should be drained well, otherwise the Rhizoctonia disease may cause low yields and inferior tubers.

As a result of numerous tests conducted in all parts of the State, potato spraying has been found to be profitable on all Maryland potato crops. Home-made Bordeaux mixture 4-4-50 (unslaked lime) 4-6-50 (hydrated lime) has been found to be the best material for potato spraying. When Colorado potato beetles or blister beetles are present, two pounds of calcium arsenate should be added to every 50 gallons of the mixture. Spraying should begin as soon as the vines can be detected in the rows, and should be continued at one to two week intervals as long as it can be continued without severe injury to the vines. If Late Blight appears or leaf hoppers or flea beetles become numerous more frequent applications may be advisable. Home-made Bordeaux mixture has been compared with many other copper compounds and other chemicals as well as with dusting. In all of our tests the largest yields have always been obtained in the plots sprayed with the home-made Bordeaux mixture.

Roguing potato fields for diseases and mixtures is an important operation which is omitted by many potato growers. It is usually of greatest importance in fields which are intended for the production of seed stock, but when the Wilt disease appears it is of utmost importance in commercial fields as well. In seed fields all mixtures and virus diseases should be removed as soon as they can be recognized. The entire plant, including the seed piece, should be dug up, placed in a sack and carried from the field. In this way the danger of spreading virus diseases throughout the field is eliminated. In commercial fields the removal of virus diseases and mixtures is not necessary, but if symptoms of the Wilt diseases appear the potato grower must rogue his field if he wishes to continue in the potato business. Every plant which shows the presence of the Wilt disease will produce tubers with vascular discoloration. This discoloration is very objectionable in table stock as well as seed stock. The sale of potato stock with vascular discoloration may ruin the reputation of a potato grower or even of an entire potato growing community. The University of Maryland experimental plots have been persistently rogued and all plants with symptoms of the Wilt disease have been removed from the field. This seed stock has always been practically free from vascular discoloration. A number of Maryland potato growers are now roguing their fields and removing plants with Wilt symptoms. They are having no more trouble with vascular

discoloration in their potatoes, and are convinced that roguing has been profitable.

Studies with new varieties, production of disease free, thrifty seed stock, seed maintenance, disease control and spraying are being continued in Maryland. In co-operation with the U. S. Department of Agriculture, work on the breeding of potato varieties resistant or immune to vascular discoloration has begun.

A COMPARISON OF SOME OF THE RESULTS OBTAINED FROM FERTILIZER PLACEMENT STUDIES AT THE VIRGINIA TRUCK EXPERIMENT STATION

By M. M. PARKER
Horticulturist

A fertilizer mixture compounded of the best materials available and formulated to suit the exact requirements of a given crop may lose much of its value, and in some cases may prove to be actually harmful, if the underlying principles of fertilizer application are ignored. To bring out its real value requires the avoidance of certain hazards necessarily associated with the improper use of most fertilizer materials.

The more readily soluble fertilizer ingredients go into solution soon after they are applied and produce a strong concentration of the salts, if only a limited amount of soil moisture is present. This concentration is diluted and becomes less injurious to the plants when it comes in contact with additional soil moisture. The rapidity of the dilution and the movement of these salts is regulated to a large extent by the amount of existing soil moisture. Under dry conditions the moisture moves upward in the soil carrying the salts with it, and as evaporation takes place at the soil surface a concentration of salts is built up that may prove toxic to germinating seeds or to plants. When more favorable soil moisture conditions prevail, as during periods of rainfall, the salts are diluted and move downward. Therefore, a given fertilizer placed above or below the seed or mixed with the soil near the seed proves injurious in some instances and non-injurious in others.

It is customary to apply the fertilizer a few days in advance of seeding to avoid the danger of planting when the concentration of salts may prove injurious. This, however, gives no assurance that the concentration will be below the danger point and sometimes the delay in planting until after a heavy rain may cause so great a dilution that some of the readily soluble elements may be lost through leaching. Broadcasting, to reduce the concentration of the fertilizer and thereby lessen the chance of injury, is a common practice, but it is open to several objections when row crops are being grown.

The fertilizer may be placed so far from the plant that it is of little benefit during the early period of growth and a large part of the nitrogen may be lost by leaching before the plant is able to utilize it.

Since placements of fertilizer materials above or below the seed, mixed with the soil, or broadcast have their limitations, side placements are being investigated as a possible recourse. As the movement of salts is mainly up and down in the soil, very little side or lateral movement is likely to occur. Placing the fertilizer a few inches to the sides of the seed allows the tap root of the seedling to penetrate between the bands of fertilizer, and the lateral roots which come later enter the fertilized zone after the salts have become sufficiently diluted that injury is not likely to occur. It is generally recognized that fertilizers are most effective when applied shortly before or at the time of planting provided seedling injury can be avoided. The side placement of the fertilizer not only lessens the danger of seed injury, but also eliminates one operation in the planting of the crop; in other words, it combines the planting and fertilizing operations.

For the past several years experiments have been conducted at the Virginia Truck Experiment Station at Norfolk, Virginia, comparing various fertilizer placements when applied to certain truck crops. This work has not been concluded, but the results already obtained do indicate the advantages and disadvantages of certain placements.

Snap Beans

Five fertilizer mixtures were placed in three positions in regard to the location of the seed of Bountiful snap beans grown as a spring crop. The fertilizer mixtures were used at the rate of 1000 pounds to the acre. They consisted of a phosphorus series containing 6-0-5, 6-6-5, and 6-12-5 mixtures, and a potash series consisting of 6-6-0, 6-6-5, and 6-6-10 mixtures. The placements of the fertilizers were as follows: Broadcast; in bands two inches away from and two inches below the seed level; and in a band approximately three inches below the seed.

Effect on Germination: The most striking feature of placing the fertilizer in a band beneath the seed was the relation between the potash content of the fertilizer and the germination percentage obtained. As the potash content of the fertilizer was increased, a proportionate decrease resulted in the number of seeds that germinated. The fertilizers containing phosphorus, when placed beneath the seed, also had a depressing effect upon germination, but large amounts of phosphorus did not affect the germination as severely as did the large amounts of potash.

Applying the fertilizers broadcast resulted in a lower germination of the seed than was obtained from similar fertilizers placed in bands on each side of the seed. Here again the larger amounts of potash

were more detrimental to seed germination than were the smaller amounts.

Fertilizer mixtures placed in bands on each side of the seed did not interfere with the germination of the beans. In fact, there seemed to be a slightly stimulating effect when the materials were placed in this position.

Effect of Fertilizer Placement on Yield: All of the fertilizers placed in a band beneath the seed resulted in a reduction in yield compared with that obtained from broadcasting or from side placement. This reduction was due primarily to seedling injury resulting in a lesser number of plants contributing to the yield. The fertilizer that most severely reduced the number of plants resulted in the lowest yield.

Altho the results obtained from broadcasting were sometimes very good, the side placements consistently produced highest yields.

Effect of Fertilizer Analysis on Yield: Of the fertilizers under consideration the mixture containing 6 per cent nitrogen, 6 per cent phosphorus, and 5 per cent potash gave the highest yields. Where phosphorus or potash was motted, the yields were comparatively low.

Fordhook Lima Beans

The fertilizer treatments used with snap beans were also used on Fordhook beans. The effect of the placement on the germination of Fordhook beans was also marked. Placing the fertilizers in a band beneath the seed resulted not only in a retardation in the rate of germination, but also in a reduction of the number of plants. Band placement of the fertilizer on each side of the seed gave the most rapid and the highest total germination of any of the fertilizer placements. Altho the rate of germination when the fertilizer was broadcast was not as great as the side placement, the final stand of plants was as large.

The lima beans were grown in a rotation that included a heavily fertilized crop just prior to their planting, and the residual effect of the fertilizer so influenced the yield of Fordhook beans that the results might be misleading. Consequently, they are not included in this discussion.

Garden Peas

The five fertilizers discussed under snap and Fordhook beans were used with Thomas Laxton peas in a comparison of band placements on the sides of the seed and mixing the fertilizer in the row prior to planting. Germination was decidedly better when the band placement method was used. Because of the extremely dry conditions prevailing, yields from both methods of placements were comparatively low, but where fertilizer was placed in bands the yields were superior.

Cabbage

Transplanted Copenhagen Market cabbage seedlings were used in an experiment with the five fertilizer mixtures applied in four ways. The rate per acre and placements were as follows: 1. 1000 pounds of fertilizer mixed with the soil before setting out the plants plus an additional 1000 pounds as a sidedresser. 2. 2000 pounds as in 1, no sidedresser. 3. 1000 pounds applied in bands on each side of the plant plus 1000 pounds as a sidedresser. 4. 2000 pounds as in 3, no sidedresser.

Better results were obtained where the fertilizers were mixed with the soil before setting the plants than where they were placed in bands on each side, but in both cases increased yields were secured where half of the fertilizer was used later as a sidedresser.

When the plants were set sufficient soil moisture was present that the salt concentration did not become toxic and the seedlings started off rapidly when the fertilizer was mixed with the soil in the row. If, on the other hand, dry conditions had prevailed at the time of transplanting, it is probable that injury to the roots would have resulted.

Omitting potash or phosphorus from the fertilizer mixtures resulted in very low yields. The lack of phosphorus, however, was a more limiting factor than was the lack of potash. No additional response was obtained from the fertilizers containing more than 5 per cent potash or phosphorus when the materials were mixed with the soil. Increases in yield occurred with the band placement method when the potash content was as high as 10 per cent, and the phosphorus as high as 12 per cent. The response to greater quantities of potash and phosphorus in the band placement may have been due to the type of root system developed. A concentration of the roots in the fertilized zone prevented the full utilization of the residual soil potash supply and made the plant more dependent on the supply of potash in the commercial fertilizer. Mixing the fertilizer with the soil caused a greater dispersal of the root system which permitted a fuller utilization of the supply already in the soil.

Tomatoes

Preliminary investigations at Onley, Virginia, with transplanted tomatoes indicated that they responded to fertilizer placement in a manner similar to transplanted cabbage. The largest yield obtained was from that placement in which one-half of the fertilizer was mixed with the soil before setting the plants and the remainder was used as a sidedressing. The lowest yield resulted from placing the fertilizer in a circle around the plant after setting in the field.

An analysis of the fertilizer placement experiments at the Virginia Truck Experiment Station indicates that the side placements of the materials give better results than other placements of the fertilizers

when field sown seed are used in producing the crop. When transplants, such as cabbage and tomatoes, are set in the field, the side placement of the fertilizer has not yet produced entirely satisfactory results.

INFORMATION ON LIME AND FERTILIZER NEEDS OF TRUCK SOILS

R. P. THOMAS
University of Maryland

The commercial truck and vegetable growers use, as a rule, the loose and coarse textured soils. Such soils promote a greater and more rapid penetration of water. The amount of finely divided soil particles is so small that the amount of physical and chemical sorption is generally low. Leaching in such soils is rather extensive. The retention of plant food is limited. As a result of all these factors truck soils have a tendency to be low in fertility. Large amounts of fertilizers are needed to correct this deficiency trend and also to improve the quality of the produce.

The kind and amount of fertilizer needed on truck soils will vary with the crop and specific requirements of the soil. In order to estimate their need a rapid and rather inexpensive method of testing these soils has been developed. By the use of these tests it is believed the fertilizer needs of soils can be more accurately estimated. For truckers who use large amounts of fertilizers oftentimes considerable savings can be realized by a careful and systematic sampling and testing of their soil.

A brief description of the many different tests will be given in order to explain the values of the tests. The degree of acidity or lime need is ascertained by a pH determination, the amounts of soluble calcium, magnesium, iron and aluminum and the organic matter content. The phosphorus level of the soil and response to this fertilizer ingredient is determined by the amounts of soluble phosphorus, calcium, magnesium, iron aluminum, and the organic matter content. The potash need is estimated largely from the results of the potassium test. The need of the minor plant foods such as magnesium, manganese, boron, copper, and zinc is determined when possible. The magnesium or manganese required can be judged fairly accurately. Tests for the other rarer elements have not been perfected for small or deficient amounts.

The results of these tests give only an indication of the fertilizer requirements. They have to be supplemented by a complete history of the soil, treatment, crop rotation and crop response. A large part of this information will have to be supplied by the grower. Although the tests are a valuable aid in diagnosing the needs of a

soil for the respective crops it is essential that all additional information regarding these soils and crops be secured. It is believed that rapid soil testing is a valuable aid in recommending the proper fertilizer for truck crops.

This testing service is given to the farmers at no cost whenever it is possible. Many who have used this service regularly claim they have profited materially by it. Samples of soil which are sent in to be tested should be carefully taken. They should represent several areas within a field. If the soil varied in its color, texture, crop producing power, or topographic relation, separate composite samples should be sent in for each different area. A pint of the composite sample is sufficient. Only clean and moisture proof containers should be used for sending or bringing in the soil samples. Each sample should be carefully and properly labled. When possible, the letter giving the history of the soil should be attached to the samples. If mailed, no letter should be inside the wrapping.

REPORT OF COMMITTEES

The Nominating Committee presented the names of the following persons as officers for the year 1937:

President—H. J. W. Rayner, Salisbury.
Vice-President—E. W. Hawkins, Harmons.
Secretary-Treasurer—W. R. Ballard, College Park.

Directors:
Francis B. Todd, Sparrows Point.
Elmer Koppleman, Raspeburg.
J. Richard Fitzell, Sparrows Point.

Director Farm Bureau—Joshua Lynch, Parkville.
Delegate Farm Bureau—R. T. Merritt, Dundalk.
Director Agricultural Corporation—Wm. G. Lynch, Dundalk.

The report of the committee was adopted.

The auditing committee examined the treasurer's books and found them in order. The balance in the treasury as of December 31, 1936, was $53.35.

Potato Show

The exhibit of potatoes, both in the certified, commercial, and junior classes, was somewhat larger than in previous years. This show is being sponsored by the Association in an effort to stimulate interest in good seed stock.

The awards made in the various classes are as follows:

Group 1—Adult Certified—Class 1

1st—Howard Schlosnagle, Accident	$2.50
2nd—Foster Yost, Accident	1.50
3rd—George Buckingham, Marriottsville	1.00
4th—William P. DeBerry, Oakland	1.00

Group 1—Adult Certified—Class 2

1st—Foster Yost, Accident	2.50
2nd—Clark Schlosnagle, Accident	1.50
3rd—Howard Schlosnagle, Accident	1.00
4th—Allan Kelly, Oakland	1.00
5th—William P. DeBerry, Oakland	1.00

Group 1—Adult Certified—Class 3

1st—Carl H. Smith, Salisbury	2.50
2nd—W. P. Hutton, Salisbury	1.50
3rd—Rayner Brothers, Salisbury	1.00

Group 2—Adult Commercial—Class 4

1st—Emmert Miller, Accident	2.50
2nd—Paul Miller, Accident	1.50
3rd—O. W. Burtner, Sharpsburg	1.00
4th—William P. De Berry, Oakland	1.00
5th—Robert Miller, Accident	1.00

Group 2—Adult Commercial—Class 5

1st—William Custer, Oakland	2.50
2nd—Foster Yost, Accident	1.50
3rd—George Buckingham, Marriottsville	1.00
4th—Paul Miller, Accident	1.00
5th—Robert Miller, Accident	1.00

Group 2—Adult Commercial—Class 6

1st—Willard J. Toadvine, Salisbury	2.50
2nd—Carl H. Smith, Salisbury	1.50

Group 3—4-H Certified—Class 7

1st—Marion Schlosnagle, Accident	3.00
2nd—John R. Jehle, Hyattsville	2.00

Group 3—4-H Certified—Class 8

1st—Eugene Schlosnagle, Accident	3.00
2nd—John R. Jehle, Hyattsville	2.00

Group 4—4-H Commercial—Class 9

1st—Paul Miller, Accident	3.00
2nd—Wade Frazer, Oakland	2.00
3rd—Owen Frazer, Oakland	1.00
4th—Robert Miller, Accident	Ribbon
5th—Raymond Schlosnagle	Ribbon

Group 4—4-H Commercial—Class 10

1st—Paul Miller, Accident	3.00
2nd—Robert Miller, Accident	2.00
3rd—Roger Burtner, Keedysville	1.00

Prizes for 4-H Classes donated by Md. Farm Bureau Fed.

REPORT
OF THE
EIGHTH ANNUAL MEETING
OF THE
Maryland Stockmen's Association
January 13, 1937
Baltimore, Maryland

President Stanley P. Stabler of Montgomery County, in the President's annual address, opened the forenoon session of the Eighth Annual Meeting of the Maryland Stockmen's Association in the Lord Baltimore Hotel.

PRESIDENT'S ADDRESS

By STANLEY P. STABLER
Montgomery County

I want to welcome you all to the eighth annual meeting of the Maryland Stockmen's Association. I think, as usual, we have been a little late getting the crowd together. We always have had an interesting meeting in the past, and I hope this will be no exception, as we have a very good program before us.

It seems to me that we should consider briefly just why we are here, and why we have this Stockmen's Association. It may be a little hard definitely to put a finger on any particular projects that we have, but it seems to me the major purpose of the Stockmen's Association is to serve as a sort of training school for livestock men. The livestock business is one that requires that we keep ourselves well posted, and this is one occasion when we can get together and exchange ideas and try to keep up with the times.

We want not so much to increase our livestock as to make it more profitable than we have in the past. We have to keep our eyes open and to see where we can prevent waste. We want to watch the rat holes, or we will find ourselves "coming out of the little end of the horn," more or less. We want to consider how much we are putting into what we produce, and how much we can get for it. For the past few years we have just about broken even. There seems to be a better prospect ahead for livestock men now, and if we keep ourselves posted, and try to stop all those rat holes, we can expect to make some material progress.

It seems to me that there are four points that we have to keep in mind in this business of producing livestock. The first is to have the right type of animals, the type best fitted for our farms. There is

very little excuse for raising any poor quality animals. The only possible excuse for having any but good animals on your farm is in the case of feeder cattle. Sometimes it pays to buy cheap feeder cattle, but in raising animals it is always well to keep in mind that the proper kind of animal pays a whole lot better than do those of poorer type. After we get the right type of animal, we must manage them wisely and feed them properly. All that is a man-sized job.

The way the Stockmen's Association tries to help the livestock men is by keeping these facts before them as to the most efficient ways of production, and the chief method of disseminating this information to our members has been through the annual meeting and through our News Letters. I expect the members when they get those news letters think we keep harping on the same points all the time, but these are basic, necessary points, and we want to emphasize them. Unless we follow that advice we are not going to make the advance that we should be making. I think that the News Letters which the secretary has been getting out each month have been well worth while.

In regard to the annual meeting, it has been suggested that we come here every year for a short meeting. We are generally so crowded that we are unable to get through our discussions. We do not begin to get as much discussion as we would like to have. I think we are agreed that we would like to do something about that, make some suggestions to the new officers and the Executive Committee. We discussed that at our Executive Committee meeting. The suggestion was made that we have an all-day meeting the day before the Farm Bureau meeting, and in that way we would get a little more time to take up the things we would like to take up in our annual meeting.

Another of the very important phases of our work which we have not done until this year, and that is something in the matter of having tours. We had a report on that at our Executive Committee meeting, and we would like to take it up more in detail. That is one phase of our Stockmen's program that has proved very interesting, and I certainly hope that we will make that a definite part of our program.

I feel that as President I have neglected the Stockmen's Association this year more than I should. I hope—and I am sure—that the new officers will do a little more than I have done in the way of promoting livestock tours and general livestock work in 1937. With the right kind of livestock planning and operations we can have a prosperous bunch of stockmen in this State. The men in this State are doing fine work now, but we should try to reach a few more men who are in the livestock business and try to make that business more profitable in the future.

The first business I think we have to take up is the report of our Secretary-Treasurer, Mr. Carmichael.

REPORT OF SECRETARY-TREASURER

B. E. CARMICHAEL
College Park

Mr. Chairman and Gentlemen: This annual report will not be a long one. During the year 117 membership dues were paid. While this is a substantial number, there should be a still larger group of stockmen of Maryland who are sufficiently interested in the work of the Maryland Stockmen's Association to pay a dollar for annual dues. It should be said that there is a substantial group of stockmen who regularly keep up their membership; the support that these men supply is gratefully acknowledged.

The year has been characterized by a healthy feeling of optimism on the part of Maryland stockmen. Market prices for livestock and livestock products are much improved and now may be contrasted with prices which stockmen could secure only a short time ago. Though there is no tendency to pay—nor to demand—extravagantly high prices for breeding animals, many Maryland stockmen are earnestly endeavoring to effect substantial improvement in their herds and flocks. This endeavor is not limited to detached individuals but is apparent in rather large groups of stockmen. All things considered, it seems doubtful if the outlook for improvement in Maryland's livestock industry in its various phases was ever more promising than at present.

Twelve issues, one for each month, of the Association's News Letter have been issued. Though some stockmen have expressed the belief that the News Letter is a worthwhile undertaking, your secretary feels sure that a more active interest on the part of the members will help the News Letter greatly. There is need for many more news items concerning important livestock events in the State. If each member will make it a point to send details in for use in the News Letter, a greatly improved publication can be produced. To date, the News Letters have been too largely the result of the secretary's attempts to write articles of timely interest. Now there is urgent need for a greater cooperation on the part of members and officers to make the News Letter of more interest and value to the livestock farmers of Maryland.

The financial condition of the Association is shown in the treasurer's report, which is as follows:

FINANCIAL REPORT, MARYLAND STOCKMEN'S ASSOCIATION, JANUARY 13, 1937

Receipts

Balance, January, 1936	$ 186.97	
Banquet receipts	122.30	
1936 memberships (4 included in former report)	113.00	
1937 memberships to January 11	22.00	
Union Stock Yards Co. contribution	7.00	
Total, balance and receipts		$ 451.27

Expenditures

Childs' Restaurant, 132 dinners at $1.00	$ 132.00	
Expenses, Misses Bresnahan and Gooden, helping at Annual Meeting	2.20	
F. H. Sowers, 2500 envelopes and printing	11.50	
University of Maryland Supply Store, mimeograph paper and stencils	9.25	
F. H. Sowers, printing 1000 sheets paper and 2500 envelopes	15.00	
Md. Farm Bureau Federation Annual Dues	20.00	
U. of Md. Student Supply Store, stencils	3.00	
U. of Md. Student Supply Store, mimeograph paper	2.75	
Pearson and Crain, engraving cup	1.25	
Postmistress, College Park, 600 postcards	6.00	
E. A. Weimer, printing 300 banquet tickets	1.00	
Telephone and telegraph a/c Annual Meeting	.60	
Student Supply Store, mimeograph paper and stencils	6.25	
Total expenditures		$ 216.55
Balance, January 11, 1937		$ 234.72

PRESIDENT STABLER: You have heard that report. What is your pleasure?

It was moved and seconded that the report be accepted as read, and motion duly carried.

PRESIDENT STABLER: In that connection I think it is customary to appoint an auditing committee.

MEMBER FROM THE FLOOR: I move we accept the Secretary's report without an auditing committee's report.

Motion seconded and carried.

PRESIDENT STABLER: I think that shows due confidence in our Secretary-Treasurer.

As I said a while ago, the Executive Committee unfortunately did not get everything done that it should have done, but it did discuss what the Stockmen's Association should do in the matter of the annual meeting for 1937, and that will be up to the new officers, but we recommend that the new President, the new officers—or rather we suggest that the new officers call an executive meeting

this afternoon and consider their work for 1937. As I said before, we met and passed a few recommendations, and I am going to ask Mr. Sam O'Sullivan to give a brief report of the Executive Committee meeting.

MR. O'SULLIVAN: The matter of the tours was one of the things that we discussed, and the suggestion was made that we have at least four tours during the year, and that the method of procedure should be for the executive committee to plan where these tours are to be held some time during the meeting today; that is, the committee should agree concerning the time these would be held, and the section in which they are to be held, and then it would be up to the county agents in the respective counties to work out the details, and have it for their responsibility to get as many as possible of farmers and others interested in livestock to attend these tours.

Another suggestion that came up for discussion by the committee about the future work was that we should in some way get the county agents more interested—no doubt they are interested now, but to have them give more time and help to the livestock work.

Then in the executive committee meeting the show question was discussed. Everyone who was at the Baltimore Livestock Show did not have to look very long to see which county agents were doing the most work. I know our county agents have lots of work to do, but this Association should demand that they give more help to our work. This can be done by having committees in the counties to work with the county agents, getting them to outline a program, and then carrying out that work. If the county agent finds this other work is crowding him too much, let these county committees do the real work or get him more help, but let him go ahead with the livestock work.

Now, in the matter of the annual meeting, Mr. Stabler brought out the question of having more time for that. I think the Executive Committee approved that. There should be some way worked out so that more time can be given for the annual Stockmen's meeting rather than have only a couple of hours for all these topics. We want to get together and go into a real discussion on each type of livestock, and that would mean that we should probably have an all-day meeting. Why not have an all-day meeting and really get down to the facts in these different branches?

I think that covers the Executive Committee's recommendations.

PRESIDENT STABLER: You have heard the report from Mr. O'Sullivan. These county agents probably have been more or less of a sore spot to a great many livestock men. We have talked around under cover, but we did not see any use keeping it under cover any longer. They do have some excuse in that they have done a lot of work and put a lot of time on this soil conservation work, but, after all, to my way of thinking, livestock is the real basis of soil

conservation. If we insist that these men put more time on livestock work, it will do a whole lot more good for the stockmen of this State if they want to continue that work to let us have some help, let those men have enough time to do some real livestock work. I understand that in some counties the county agents are doing conservation work and livestock work too. Some may have enough time for that. We just brought that up to present it for your consideration. Maybe we have the wrong slant on it. Is there any further discussion on that report?

MR. MCGREGOR: I would suggest that this meeting appoint a committee to go into the matter; that more time be allotted to carry on not only the livestock meeting, but all of the livestock industry work. We have only about two hours once a year to discuss things that are of concern to the whole livestock industry. I would move that a Committee be appointed from this meeting to go into this matter.

The motion was seconded.

PRESIDENT STABLER: Do you think we should make that a definite committee appointment now or leave it to the new officers?

MR. MCGREGOR: Do it now.

MR. DAVIS: Look at your program tomorrow morning. I do not see anything to prevent you fellows from getting together for a meeting.

PRESIDENT STABLER: Nothing to stop us, but most of us can only come here today. I do not know how many will be here tomorrow.

Is there any further discussion?

MR. W. R. HARVEY, Baltimore County: I am almost ashamed of myself when I look around this room at this meeting and see how many county agents are here. They just have not turned out. This just shows in itself just what their interest is in livestock. I have not a single criticism to make of any particular agent, but I am criticizing that part of their work in the livestock line. For instance, during the last livestock show, the county agents from other states were down in the show ring helping those boys to arrange their exhibits, helping them in every way so they could present their exhibits properly before the judges. But where were our county agnts? I think there possibly could be some arrangement made whereby the 4-H Club boys might have more help from our county agents.

MR. J. W. JONES, Montgomery County: I have a small concern in this matter. I sympathize with these county agents throughout the State and throughout the United States at the present time. They are overwhelmed with a lot of business that the government expects them to do. I do not see why some of them do not go crazy. I do think that in the State of Maryland we ought to have them devote more time to livestock. As it is, there is very little interest in the

production of livestock and in the marketing of livestock. I think one recommendation that should be made to your incoming Board of Directors and the Executive Committee that will be organized is that they should turn their attention to the marketing of livestock.

The farmers have taken a lot of this stock in our cooperative livestock marketing organization, and it is going along splendidly, and doing good work. But I think we need to make it stronger—there are hundreds of farmers in Maryland who do not market their stock through marketing organizations, even after they have become members of it. I have been in touch with the 4-H Club boys, and I believe those boys are doing a good job. But our market is not as good as that of some of the neighboring states. The Lancaster market has grown by leaps and bounds. People in Pennsylvania are very much enthused, and they are having a better grade of livestock than before.

I am a little critical of our whole livestock situation in this State. I think the county agents should take more interest. I agree with what Mr. Harvey has said about those agents from other states taking more interest down in the show ring. The county agents from Virginia, West Virginia, Tennessee, and North Carolina seemed much more interested in livestock. They were simply right on the job. We do not have enough cooperation in the State of Maryland. Of course, we are close to the Baltimore market, and perhaps they think we do not need their help so much in the marketing. But I think down at the University they should show more interest in us. Perhaps they will when this committee goes down there to talk the matter over with our county agents.

PRESIDENT STABLER: Is there any further discussion?

MR. O'SULLIVAN: Mr. Jones mentioned something that always sets me off as to the marketing. That is the biggest job the farmer has. If you go to the other states to find some good purebred stock, and you do not find it at one place, the farmer will tell you where you can get it. I am sorry to say that the Maryland farmer who has purebred animals does not have that help from his neighbors. They never seem to know what their neighbors have. We ought to get together on that.

PRESIDENT STABLER: This is a subject that is going to take lots of time, but I realize that we shall have to proceed. I understand that there is a motion on the floor that a committee be appointed to confer with the Extension Service and demand more livestock work by county agents and extension men. Is there any further discussion on that, or do you want to leave it up to your Committee?

Call for question.

PRESIDENT STABLER: All in favor please say "aye." The motion was carried.

Mr. Wm. J. Hines of Montgomery County offered the following resolution:

"Whereas, we have spent six million dollars in this country during 1914-15 to eradicate foot and mouth disease that was traced directly to the importations of dressed beef in 1914; and

"Whereas, Argentina wants to have Section 306-A of the Smoot-Hawley Tariff Act altered that they might send in meat products from such areas as are declared free from these plagues; and

"Whereas, we do not believe it humanly possible for one area of a certain country to be restricted against the movement of livestock to another section of the same country, when there is a rich export concerned:

"Now, therefore, be it resolved, that we of this Livestock Association go on record as opposing any change of Section 306-A of the Smoot-Hawley Tariff Act, and that we do not approve of any meat products from any country until that country is entirely free of foot and mouth disease."

Mr. Jones of Montgomery County seconded, and the resolution was carried.

It was moved and seconded that a copy be sent to the Farm Bureau Resolutions Committee for its approval, to be submitted to the General Session, if it meets with their approval.

The motion was carried.

PRESIDENT STABLER: Next on the program is the "1936 Livestock Show," by Mr. W. R. Harvey, Manager.

BALTIMORE'S EIGHTH ANNUAL LIVESTOCK SHOW

W. R. HARVEY
Baltimore County

Baltimore's eighth annual Livestock Show was held at the Union Stock Yards, October 6-10, 1936, with the quality of the stock in all classes very much better than had ever been exhibited at any of the former shows and better than had ever been assembled at any show held east of Chicago.

There were, in all, over 375 entries in the different classes, distributed as follows:

Carload lots of 15 head each of fat cattle	21 entries
Trios of steers, in the open class	9 entries
Trios of steers, in 4-H Club class	13 entries
Individual steers in the open classes	37 entries
Individual steers in the 4-H Club classes	141 entries
Carload lots of 20 head of feeder cattle	15 entries
Pen of three fat hogs weighing 150 to 225 pounds	16 entries
Individual barrows weighing 150 to 225 pounds	29 entries
Pens of 25 head of fat lambs	3 entries
Pens of three fat lambs	24 entries
Individual lambs in the open class	8 entries
Individual lambs in the 4-H Club class	44 entries

Collegiate Livestock Judging Class

On Tuesday morning the cattle were all gone over by the weeding committee.

The Students' Collegiate Livestock Judging Contest got under way by nine o'clock Tuesday with the following results:

1st prize with $75 in cash to Pennsylvania State College, State College, Pa.
2nd prize with $50 in cash to West Virginia University, Morgantown, W. Va.
3rd prize with $25 in cash to Cornell University, Ithaca, N. Y.
4th prize to Virginia Polytechnic Institute, Blacksburg, Va.
5th prize to University of Maryland, College Park, Maryland.

Maryland 4-H Fat Stock Judging Contest

Working on the same classes of stock, under the direction of Messrs. Joseph M. Vial and Mylo Downey, the 4-H Club boys of Maryland put on their first livestock judging contest. The boys worked in groups of three, which constituted a team, one team coming from each county represented. There were 13 teams entered, working on classes of horses, cattle, sheep and swine. These boys did a very commendable job, and we may look for a big improvement along this line at the 1937 Show. The teams were rated as follows:

1st. Kent County.
2nd. Montgomery County.
3rd. Harford County.

Theodore Redman of Kent County was high man in the 4-H Contest.

In addition to the cash awards offered in these classes, the Union Stock Yards Company, through its President, Mr. J. C. Cash, awarded an expense-free trip to the International Livestock Exposition at Chicago, to the club member making the highest total score in the fat stock judging contest. This was won by Theodore Redman of Kent County.

An additional expense-free trip was awarded to the outstanding livestock 4-H Club member; this distinction was won by Guy Nelson of Baltimore County. This trip was offered by the Maryland Bankers' Association.

Two additional trips were awarded to Club members, this being made possible by some saving in the transportation cost, through the kindness of Mylo S. Downey in driving through to Chicago with the four boys.

The two additional boys making the trip were Maurice Ahalt of Frederick County and Grafton Timberlake of Harford County.

At the time of their departure for Chicago, they were given some instructions and good advice by Mr. Cash. The boys were in high spirits and seemed to look forward to having a big time.

Mr. Cash asked each of the boys to write him a short letter after they got back and tell him in his own way what he saw in his entire

trip that was most interesting and impressed him most. The boys responded very soon after getting home and each of them sent in a splendid letter telling us just what seemed to take his eye—in this there was considerable difference, and no doubt these letters would indicate more the individual interest in the different things that they saw, as well as to outline the interest that these different boys might have in the livestock industry and the different branches of which they would follow.

After going over these letters very carefully, it was decided that the letter written by Maurice Ahalt was the best in that it was more along the line of a letter written by a boy who was really interested in the livestock industry, thereby being more along the line of thought of those who sponsored the trip.

We have Maurice here with us, and I am sure that we will all be glad to have his winning letter read, telling of his trip to those assembled here.

At one o'clock the judging of the livestock began and continued on until Wednesday afternoon just as scheduled in the premium list, with the following results.

The Grand Champion and Reserve Champion carloads of Fat Cattle were exhibited by George B. Holtzman, Mt. Jackson, Va. This is the third time that Mr. Holtzman has won this coveted award. The Grand Champion load sold for 15 cents a pound and the Reserve Champions for 12½ cents, both loads going to the Wm. Schluderberg-T. J. Kurdle Company.

The Individual and 4-H Club Steer classes were the outstanding features of the show. There were 76 Hereford and 50 Angus steers lined up before the judges, as good as were ever exhibited in their classes at any show in America. The Grand Champion Steer was exhibited by Wickwire Farm, Earleville, Md., selling for 50 cents a pound, the Reserve Champion, which was also Champion 4-H Club Steer exhibited by Ralph Fox, Shaver's Mill, Va., sold for 25 cents, both going to Heinz Riverside Abbatoir.

The Grand Champion carload of Feeder Cattle were Angus exhibited by Canterbury Farm, Warrenton, Va., and sold for $12.35 per cwt. to Bryce Wing, Fallston, Md.

The Fat Hog and Lamb entries far outnumbered those at any of the former shows with outstanding quality individuals in every class. The Grand Champion pen of 20 Fat Hogs, which sold to Corkran Hill, were exhibited by Pioneer Point Farm, Centreville, Md. Delbert L. Ebeling, Sykesville, Md., had the Grand Champion Pen of Three Barrows and Individual Barrow, the pen selling at 12½ cents to Schluderberg-Kurdle and the Individual to Meyers of Westminster, Md., for 13¾ cents.

The Grand Champion Pen of 25 Fat Lambs was exhibited by the Harford County 4-H Club Boys, selling to Corkran Hill Co. at $15.25

per cwt. The Grand Champion pen of three Lambs, exhibited by Henry Heaps, Pylesville, Md., went to the same buyer at 17 cents a pound. The Grand Champion Individual exhibited by Roy Moxley, Darlington, Md., to Corkran Hill Co. at 41 cents. The average price for all Lambs on exhibition was $13.98 per cwt.

Following are the awards in all classes:

FAT CATTLE

Competition in all classes of Fat Cattle is open to entries from the States of Ohio, Pennsylvania, Delaware, New Jersey, Tennessee, Virginia, West Virginia, North Carolina, Maryland and the Southern States.

Following are the awards in all classes:

DEPARTMENT "A"

CARLOAD OF FAT CATTLE

CLASS 1

Carload of 15 head of Steers or Heifers weighing over 1100 pounds.

First—H. Teller Archibald, The Plains, Va.; second—H. Teller Archibald, The Plains, Va.; third—Frank Adair, Andersonburg, Pa.

CLASS 2

Carload of 15 head of Steers or Heifers weighing under 1100 pounds.

First—G. B. Holtzman, Mt. Jackson, Va.; second—George Holtzman, Mt. Jackson, Va.; third—Cremona Farms, Mechanicsville, Md.; fourth—Archie F. Adair, Centre, Pa.; fifth—Clinton L. Riggs, Catonsville, Md.

DEPARTMENT "B"

TRIO OF FAT CATTLE

CLASS 1

Trios to be made up of Individual Steers exhibited in Department "D," fed and owned by one Exhibitor, shown at halter.

First—Wickwire Farms, Earleville, Md.; second—B. S. Oles, Kingsville, Md.; third—Arthur B. Shipley, Sykesville, Md.; fourth—Fox Hill Farms, Fallston, Md.

Grand Champion—Wickwire Farms.

DEPARTMENT "C"

TRIO OF FAT CATTLE

CLASS 1

Trios to be made up of Individual Steers exhibited in Department "E"; may be fed and owned by different exhibitors, but must be entered from, fed and owned in one county.

First—George W. Litton, Tazewell, Va.; second—P. E. Bird, Marion, Va.; third—George W. Litton, Tazewell, Va.; fourth—C. L. Stickler, County Agent, Lewisburg, W. Va.

DEPARTMENT "D"

INDIVIDUAL STEERS OR HEIFERS

CLASS 1

HEREFORDS

First—B. S. Oles, Kingsville, Md.; second—B. S. Oles, Kingsville, Md.; third—Arthur B. Shipley, Sykesville, Md.; fourth—B. S. Oles, Kingsville, Md.; fifth—Buck & Doe Run Valley Farms, Coatesville, Pa.; sixth—Arthur B. Shipley, Sykesville, Md.; seventh—W. C. Welch & Sons, Oakland, Md.

CLASS 2

SHORTHORNS

First—J. R. Searson, Raphine, Va.; second—J. R. Searson, Raphine, Va.; third—Oscar Nelson, Lewisburg, W. Va.; fourth—J. R. Searson, Raphine, Va.; fifth—J. R. Searson, Raphine, Va.

DEPARTMENT "D"

CLASS 3

ANGUS

First—Wickwire Farms, Earleville, Md.; second—Arthur B. Shipley, Sykesville, Md.; third—Wickwire Farms, Earleville, Md.; fourth—Fox Hill Farms, Fallston, Md.; fifth—Cremona Farms, Mechanicsville, Md.; sixth—Wickwire Farms, Earleville, Md.; seventh—Fox Hill Farms, Fallston, Md.

DEPARTMENT "E"

4-H CALF CLUB STEERS OR HEIFERS

CLASS 1

HEREFORDS

First—Bud Goodman, Marion, Va.; second—John J. Meek, Burkesville, Va.; third—E. S. Suttle, Jr., Jonesville, Va.; fourth—Jim Keen, Summit Point, W. Va.; fifth—Joe F. Meek, Burkes Garden, Va.; sixth—Earl Groves, Petersburg, W. Va.; seventh—Hogueland Taylor, Petersburg, W. Va.; eighth—J. M. Kinser, Jr., Bland, Va.; ninth—Elizabeth Rosenbaum, Jonesville, Va.; tenth—Anna Lee Thomas, Burkes Garden, Va.

DEPARTMENT "E"

CLASS 2

SHORTHORNS

First—Grove Brothers, Waynesboro, Va.; second—Oscar Nelson, Jr., Lewisburg, W. Va.; third—Carson Thompson, Tazewell, Va.; fourth—Jim Davis, Burkes Garden, Va.; fifth—Oscar Nelson, Jr.,

Lewisburg, W. Va.; sixth—Carson Thompson, Tazewell, Va.; seventh —Kermit Cline, Fisherville, Va.; eighth—David Tuckwiller, Lewisburg, W. Va.; ninth—Fred Harman, Petersburg, W. Va.; tenth—Raymond McKimmey, Lucketts, Va.

CLASS 3

ANGUS

First—Ralph Fox, Shavers Mill, Va.; second—Charles M. Perry, Tazewell, Va.; third—Kermit Cline, Fisherville, Va.; fourth—Alice George, Tazewell, Va.; fifth—Alva Sites, Petersburg, W. Va.; sixth —Raymond Pickett, Jr., Howard County; seventh—Merlin Burgdoll, Petersburg, W. Va.; eighth—Bud Goodman, Marion, Va.; ninth—Ned Tyler, Marion, Va.; tenth—John Rucker, Delaplane, Va.

FAT CATTLE CHAMPIONSHIPS

Grand Champion Carload of Fat Cattle—G. B. Holtzman, Mt. Jackson, Va.

Reserve Champion Carload of Fat Cattle—G. B. Holtzman, Mt. Jackson, Va.

Grand Champion Trio of Steers—Wickwire Farms, Earleville, Md.

Champion Individual Steer, Department D—Wickwire Farms, Earleville, Md.

Champion 4-H Club Steer, Department E—Ralph Fox, Shavers Mill, Va.

Grand Champion Individual Steer—Wickwire Farms, Earleville, Md.

Reserve Champion Steer—Ralph Fox, Shavers Mill, Va.

DEPARTMENT "F"

FEEDER CATTLE—OPEN TO ALL

CLASS 1

Carload of 20 head of Hereford, Shorthorn or Angus Steers or Heifers weighing under 550 pounds.

First—Canterbury Farms, Warrenton, Va.; second—H. Jasper, Cascade, Neb.; third—H. Jasper, Cascade, Neb.; fourth—H. Jasper, Cascade, Neb.

CLASS 2

Carload of 20 head of Hereford, Shorthorn or Angus Steers or Heifers weighing 550 pounds and not over 1000 pounds.

First—J. R. Hipps, Waynesville, N. C.; second—G. Calerman, Omaha, Neb.; third—J. R. Hipps, Waynesville, N. C.; fourth—John F. Walker, Marshall, Va.

CHAMPIONSHIP

Grand Champion Carload of Feeders
Canterbury Farms, Warrenton, Va.

DEPARTMENT "G"

FAT HOGS

PEN OF 20 FAT HOGS WEIGHING 150 TO 225 POUNDS

First—Pioneer Point Farm, Queenstown, Md.
Grand Champion, Pioneer Point Farm.

CLASS 2

PEN OF 3 FAT HOGS WEIGHING 150 TO 225 POUNDS

First—Delbert L. Ebeling, Sykesville, Md.; second—Warner Pearce, Monkton, Md.; third—Jesse J. Hurd, Sr., Chestertown, Md.; fourth—Richard Bennett, Sykesville, Md.; fifth—Elwood Myers, Union Bridge, Md.
Grand Champion, Delbert L. Ebeling.

CLASS 3

INDIVIDUAL BARROW WEIGHING 150 TO 225 POUNDS

First—Delbert L. Ebeling, Sykesville, Md.; second—Herman L. Ebeling, Sykesville, Md.; third—Pioneer Point Farm, Queenstown, Md.; fourth—G. T. Bennett, Sykesville, Md.; fifth—Warner Pearce, Monkton, Md.
Grand Champion, Delbert L. Ebeling.

DEPARTMENT "H"

FAT LAMBS

CLASS 1

PEN OF 25 HEAD OF FAT LAMBS

First—Harford Co. 4-H Lamb Club, Harford County; second—Cottage Hill Farm, Petersburg, W. Va.
Grand Champion, Harford Co. 4-H Club.

CLASS 2

PEN OF 3 LAMBS

First—Henry Heaps, Pylesville, Md.
Grand Champion, Henry Heaps.

CLASS 3

INDIVIDUAL FAT LAMB

First—Cottage Hill Farm, Petersburg, W. Va.; second—Cremona Farm, Mechanicsville, Md.; third—Edgar Sites, Petersburg, W. Va.; fourth—H. Paul Morelock, Westminster, Md.
Grand Champion, Cottage Hill Farm.

DEPARTMENT "I"

4-H BOYS' CLUB LAMBS

First—Roy Moxley, Darlington, Md.; second—Charles Smith, Monkton, Md.; third—Edward Stewart, Whiteford, Md.; fourth—Henry Heaps, Pylesville, Md.; fifth—Rachael Tuckwiller, Lewisburg, W. Va.; sixth—Edward Stewart, Whiteford, Md.; seventh—Robert Harkins, Forrest Hill, Md.; eighth—Rachael Tuckwiller, Lewisburg, W. Va.; ninth—Roy Moxley, Darlington, Md.; tenth—Henry Heaps, Pylesville, Md.; eleventh—Charles St. Clair, Rocks, Md.; twelfth—Richard Troyer, Whitehall, Md.; thirteenth—Thomas Galbreath, Jarrettsville, Md.; fourteenth—Mary Helen Skaggs, Lewisburg, W. Va.; fifteenth—Billy McClung, Roncevert, W. Va.

Grand Champion, Roy Moxley.

The banquet held annually in connection with the show was held at the Southern Hotel with 450 representative livestock men seated at the tables.

Hon. Harry W. Nice, Governor of Maryland, was unable to attend, but was ably represented by his executive secretary, Mr. Robert Irvin.

Hon. Howard W. Jackson, Mayor of Baltimore, who has never missed being with us, welcomed those in attendance and extended greetings to all.

The principal address of the evening was delivered by Mr. Paul Gerlaugh of the Ohio Experiment Station, Wooster, Ohio. Mr. Gerlaugh's address was confined almost entirely to the livestock producers' and feeders' feeding problems and was enthusiastically received.

There were several improvements noted by the visitors, such as the seats with a capacity of 350 people and the shavings provided for the show arena. We hope to make still further improvements at our next show.

Guessing Contest

As a special attraction at each of the annual shows, visitors are given an opportunity, without cost, to make a guess on both the live weight and dressed weight of an individual steer of outstanding quality. To the person making the closest guess of both weights, a prize of a ten-pound roast from the grand champion steer of the show is given.

The steer this year, "Lord Baltimore," was a Shorthorn, owned and exhibited by J. R. Searson, Raphine, Va. His actual weight alive was 890 lbs., dressed 527 pounds. The nearest guess was 890 lbs. alive and 538 lbs. dressed, made by French Trimble, Volga, West Virginia. There were 1,075 guesses made.

The sale of the fat cattle was held on Thursday with prices well above the prices quoted in the open market and to the general satisfaction of all.

The 438 head of fat cattle on exhibition sold for an average of $11.05 per cwt.

The 282 head of feeder cattle on exhibition sold for an average of $6.93 per cwt.

The 53 head of hogs on exhibition sold for an average of $11.53 per cwt.

The 104 head of lambs on exhibition sold for an average of $13.98 per cwt.

The entire exhibit including cattle, hogs, and lambs sold for $59,660.60.

One of the outstanding features of the show was the 44 lambs exhibited by the 4-H Club boys and girls. They showed very plainly that they had been well handled and fed during the whole of the fitting period and well presented both before the judges and in the sale ring. The greatest number of lambs to come from any one county came from Harford County, and they took back to Old Harford the lion's share of the ribbons and money and this being their first attempt, should feel very proud of their achievement, due to a very great extent to the close attention and good advice given them at all times by Assistant County Agent Myers.

The Board of Directors and the Manager hope to see everyone present, with your family and friends, at the 1937 Show. It will be time well spent to see and let your sons see just how these animals must be fitted and handled to win the Royal Purple in the various classes.

PRESIDENT STABLER: The next subject on our program is "Livestock Sanitary Work in Maryland in 1936," by Dr. Mark Welsh, State Veterinarian, College Park.

LIVESTOCK SANITARY WORK IN MARYLAND IN 1936

By DR. MARK WELSH
State Veterinarian
College Park

The Chairman's statement that I am going to tell you all about animal diseases is too large an order for me to fill in the time allotted, even though I could do so. With his permission and consideration, I would like to present a brief outline of the work that the Livestock Sanitary Service has done in the past year or two and what we hope to do in the near future.

One of our major problems for the past 18 years has been the control and eradication of bovine tuberculosis. On the initial test many counties were found to have from 15 to 36 percent of the cattle infected. In the succeeding years this gross infection was materially reduced and the majority of the infected cattle sent to

slaughter. At this time last year we had the infection rate in six counties reduced to one-half of one percent and they were accepted for Federal accreditation. Today, all counties in Maryland with the exception of two in the western part of the state are accredited. There has been a certain amount of opposition to the tuberculin test. Many are misinformed as to the nature of the test and the danger to the animal tested. Others object because of their belief, some few give no specific reasons but seem to object on general principles. The State Law is quite clear in making tuberculin testing mandatory and violation of the act carries with it fines and other penalties. We have been fortunate in convincing all but two of the desirability of testing but court cases were necessary in these two instances.

It is most necessary that all counties be accredited as rapidly as possible because the Federal government has placed a quarantine on all cattle originating in counties not listed as accredited. When animals from such counties go into the quarantine pens in stock yards they usually return less to the owner than they might otherwise.

It is my understanding that Mr. Merryman is going to discuss the problems of Bang's disease, especially from the national point of view. I would like, however, to discuss a few of the problems as we encounter them here in Maryland. At the present time we have in the neighborhood of 50,000 head of cattle under Federal, State, or private test. The majority of the pure bred herds have been tested and many of them are now state accredited. A large number of high grade herds that have surplus stock for sale are eliminating Bang's disease as rapidly as possible, as such stock from clean herds commands a higher price. These two groups comprise roughly about 20 percent of the cattle in the state and it is quite likely that our progress will be slower in the strictly commercial milk producing herds.

There is a movement on foot in certain of the counties to have the state give indemnity in addition to that now paid by the Federal government. Four states are now giving such additional indemnity and several others are introducing bills in their Legislatures for this purpose. The State of Maryland has been cooperating on Bang's disease eradication but has not actively participated in the financial features of the plan. Until we do take such an active interest it will be most difficult to control the movement of known infected animals at fairs within the state. I think we all agree that state indemnity is needed but I personally feel that it is the stockmen of the state who will primarily benefit and that the request for this money should come from their organizations. I am sure that those of us in official capacity will be glad to cooperate in every way possible but the initiative should come from you.

I would like now to mention a few of the interesting diseases and conditions we have been studying this last year. In Western Maryland

and in certain other parts of the state we have been finding a kidney disease known as pyelonephritis which is chiefly found in dairy cattle but may infect horses and other animals. It is a slow spreading infection which is usually first noted when the animal discharges bloody urine. It is a bacterial infection for which we have no adequate treatment at present. When the kidney tissue breaks down and blood is discharged with the urine, the animal as a usual thing rapidly loses weight and dies within a comparatively few months. We have no recommendations to make at present aside from employing good sanitation, detecting the infected animals as early as possible, and removing them from the herd to prevent spread of the organisms.

Mastitis is still one of the major causes of loss in our dairy herds. Several different kinds of organisms may initiate inflammation in the udder but we are finding that about 70 percent of it is caused by one type of streptococcus. When it once gets established in the udder, it is most difficult to eliminate. Drugs and biologics injected into the blood stream have not proved effective. Dyes and disinfectants injected into the udder seem to do as much harm as good. Apparently all that can be done at the present time is to use local treatment on the udder and symptomatically treat the animal. Infected milk should not be included in the shipment and it is quite questionable if it should be fed to other livestock before being boiled. We hope to be able to make some definite recommendations on the control and eradication of this disease within the year.

We recently found a disease not previously reported in Maryland, although it is fairly common through the South. This was anaplasmosis, a blood infection that is apparently spread by ticks. This disease was found on the Eastern Shore, and we have no evidence at present that it is very prevalent.

Chemical sprays used to poison weeds, as in past years, took their toll of livestock. Fertilizer left in a field to which cattle had access caused some few cases of poisoning. Paris green, lead paint and various drugs caused the loss of several head of livestock. Most of these were due to carelessness and could easily have been prevented. Poisonous plants also caused some losses, although they seemed less numerous than usual.

We are used to the idea that animals sometimes spread infection to humans, so it is rather unique when we find the reverse situation. There is a certain type of tapeworm of man that infects cattle through contaminated feed. In one instance nine out of 20 head of cattle sent to slaughter were found to be seriously infected with this tapeworm. Humans might easily become infected with tapeworm if improperly cooked meat of such animals is eaten. We are working in cooperation with officials from Johns Hopkins to try to find the sources of this infection and stop further spread.

Sporadic cases of blackleg, particularly in beef cattle, occurred in various parts of the state. It is imperative that a diagnosis be made as early as possible and the treatment be instituted if severe losses are to be avoided.

Periodic ophthalmia is not at all rare in Maryland and especially in the Western part. It is not a new infection but is one on which we have little new information to add to our previous meager store. Our laboratory has been providing cooperative veterinarians with a bacterin that seems to give some relief if used early in the onset of the infection. It seems necessary that this bacterin treatment be repeated every year to hold the infection in check. We are making no claims for this product but we seem to be getting some desirable results, which is probably more than can be said for the majority of treatments recommended.

Some of you who are in the horse breeding business may be interested to know that we are running pregnancy tests by which we can usually determine between 40 and 80 days after conception if the mare is pregnant or not. We are working in cooperation with the breeders and their veterinarians who take blood samples from the mare under test. This blood is injected into virgin rats and the changes in the ovaries and uterus noted later. About 125 mares were examined last year and the test proved about 95 percent efficient. This work was conducted free of charge last year on an experimental basis and we hope to continue it during the coming breeding season.

Streptococcic infection causing abortion and sterility in mares was encountered on some few premises. Another type of streptococcus infection was found in several sporadic outbreaks in different counties that caused horses to die within 12 to 24 hours after the first symptoms were noted. In most cases these outbreaks have occurred on premises where the sanitary conditions were not good. The infection is so acute that treatment has been of little value so far. We have isolated several strains of this organism and are now attempting to develop a serum for treatment purposes.

We are still keeping our hogs relatively free from hog cholera. As in previous years we are finding that about 80 to 85 percent of the outbreaks are due to the feeding of cholera-infected pork, about five percent are due to the purchase of cholera sick or exposed hogs, and about five percent are due to permitting roving sick hogs on the premises. These are all sources of infection than can be easily prevented by proper feeding and good management.

Swine erysipelas still seems to be on the increase or perhaps we are more readily recognizing new cases now than we did in the past. Treatment with swine erysipelas serum is quite effective in the early stages but has little value later. Hog flu has recently been reported to be identical with human influenza. If this is true it is merely another of our animal diseases dangerous to the health of the public.

In any case we are finding sporadic outbreaks which usually clear up with little loss if prompt treatment is started.

As many of you know, two of our western counties were under quarantine for rabies much of last year. There is considerable evidence that rabies is increasing in virtually all of the states east of the Mississippi river. Dogs, like other livestock, are rapidly moved in automobiles from one locality to another and of course carry their infection with them. It is imperative that we have adequate dog laws strictly enforced before we can hope to control this most dangerous and costly infection. Inasmuch as dogs cause considerable destruction of livestock and are often dangerous to the public health I feel that this association might well give consideration to the dog problem in this state.

We have at present in operation laboratories at College Park, Baltimore, and Salisbury for the benefit of the people of those communities. During the last year we made 250,000 diagnoses in our laboratories which was nearly double the number made the previous year. These laboratories, together with the other facilities of the Livestock Sanitary Service are for the assistance and aid of all of the people of the state. We are doing our best to give efficient, prompt service, and I want to express my appreciation, and that of my colleagues, for the kindly cooperation you have all given us.

MR. STABLER: I am sorry that we will not be able to give more time to this subject. Before we go any further I would like to take time to appoint the nominating committee. I believe it is customary to appoint a nominating committee to recommend officers for the following year. I will appoint on the nominating committee Mr. John Muncaster, Jr., Mr. W. Alan McGregor, and Mr. William H. Cunningham.

For the special committee to act on Mr. McGregor's motion I will name Mr. W. R. Harvey, Mr. K. A. Clark, and Mr. Sam O'Sullivan. They are to report to the next stockmen's meeting, or perhaps to the new President and Executive Committee.

Next on the program is a talk on "Bang's Disease Control Progress." This will be discussed by Mr. Louis McL. Merryman, Senior Agricultural Economist of the A. A. A., in Washington.

Mr. Merryman stated that his throat was bad, and asked Dr. Welsh to read his report, which is as follows:

REPORT ON THE PROGRESS OF THE COOPERATIVE STATE AND FEDERAL PROGRAM FOR BANG'S DISEASE ELIMINATION

BY LOUIS MCL. MERRYMAN
Agricultural Adjustment Administration, U. S. Department of Agriculture, Washington, D. C.

The cooperative program for the elimination of Bang's disease has now been in progress for thirty months. There are under supervision about 7,000,000 cattle and there have been applied approximately 14,000,000 tests, and 1,054,000 reactors have been removed. The initial infection was approximately 15 percent. The infection in all herds now being tested, counting retests, was 4.8 percent on January 1, 1937. There have been conducted in the first six months of the present fiscal year about 4,000,000 tests and about 215,000 reactors removed. This work has cost, in Federal funds, approximately $32,515,000 from July, 1934, to January 1, 1937. There are sufficient Federal funds available to carry on this work, at the present rate, for the fiscal year 1936-37. In addition, Virginia has appropriated $27,000 a year, which will be divided at the end of the fiscal year 1936-1937 between the owners of all reactors for that period. Maine, New Hampshire and Rhode Island are also paying State indemnities in addition to the Federal indemnity of $25 on grades and $50 on pure-breds. A bill for State indemnity payments lost in the New York Legislature by a narrow margin, and it is understood bills will be presented for State indemnity payments and area testing to numerous legislatures this winter.

Area testing is progressing rapidly in Virginia, West Virginia, Oregon and Utah, and is being initiated in Pennsylvania, Ohio, Louisiana, Arkansas, Nevada, Kentucky, Maryland and Delaware. Virginia has over one-half of her counties signed up on the area plan, and with over 330,000 cattle under supervision, has condemned less than 25,000 cattle. This is a very enviable record indeed. As a result, many producers are now going to clean areas in Virginia for their replacement cattle; and since July, the authorities increased the testing work materially. The counties in West Virginia, Ohio, and Pennsylvania around Wheeling and many other Ohio River towns have been area tested and these towns now enjoy a Bang's-free supply of milk.

Maryland is making very good progress in the Bang's campaign. There are about 48,000 cattle under supervision, which is over one-fifth of the cattle in the State. 100,000 tests have been applied in 9,000 herds and 7,450 reactors removed. Charles, Calvert and St. Mary's counties have been area tested and area work is now progressing in Prince George's.

New York and Pennsylvania will undoubtedly pass appropriations for elimination of Bang's disease. With Virginia and West Virginia to the south and west of Maryland, and Western Pennsylvania being able to supply large numbers of cattle from Bang's-free areas, it is most essential that Maryland get in line to supply these replacements. The Livestock Sanitary Association at a recent meeting in Chicago, recommended the branding of all Bang's reactors, and to meet the competition from neighboring States, it is not fair to honest dealers and producers of cattle for sale to let it remain possible for anyone to be able by changing ear tags or other means to ship Bang infected cows interstate from this or any other State.

The Bureau of Animal Industry will test all infected herds as frequently as necessary until they are eligible for State accreditation.

The owner who cleans up his herd will find that he will have a larger percentage of calves each year and in addition will have less difficulty in getting the cows to "settle" and less cows which he will have to send each year to the butcher on account of sterility. Breeders who are raising females for sale already know that it is practically impossible to sell females from a herd that does not have a reputation of being free from Bang's disease.

The Bureau of Animal Industry has collected retest figures on 2,801 herds in five Middle Western States containing 72,448 cattle of which 19,322 or 26.7 percent were positive and all the herds contained infected animals. On the first retest 44.2 percent did not contain any reactors, the remaining 1,562 herds contained 4,250 reactors or 7.2 percent. These figures include any herd additions made between the two tests. On the second retest 54.2 percent did not contain any reactors and in 1,283 herds there were 3,630 reactors or 6.2 percent. On the third retest 75.3 percent of the original herds did not contain any reactors; the remaining 693 herds contained 1,602 reactors or 2.7 percent.

The figures covering both retests and area tests are most encouraging. However, they do show a considerable number of herds that have infection after four tests. A study of the causes of this shows, except where there is an unusually virulent infection, carelessness in the purchase of herd replacements and unwarranted confidence in the health of cows from an infected herd which has passed a single negative test. Part of this may be attributed to a lack of clear understanding of the test itself. A recently infected cow or heifer often will not react until a considerable period has elapsed, and, if pregnant, she may calve before reacting. If one of these recently infected cows is tested before the period of incubation is over, and the owner assumes she will not spread infection and allows her to calve where other cows and heifers may come in contact with her uterine discharges, new infection may start up in the herd.

Therefore, in any herd where reactors have been recently removed, all pregnant cows should be considered a source of danger at the time of parturition. This may happen in purchased animals or in cattle negative on the initial test in infected herds. Too strong emphasis cannot be placed on the danger of allowing clean replacements to freely mingle with herds from which a considerable percentage of reactors have been recently removed.

Producers signing the Bang's contract should be clearly informed in the beginning that the agglutination test shows the presence of the anti-bodies in the blood and not the disease itself. Therefore, there is grave danger of some cows, which have recently acquired a Bang's bacillus infection, calving apparently normally or aborting before they become reactors to the test.

I believe the most practical way to eliminate Bang's disease from a herd of beef females is to start the program at the time the calves are weaned and test every thirty days until the cows start calving again. All suspects or reactors in the lower titers should be isolated from the breeding herd until they have been tested several times and the caretaker should immediately remove any cow from the herd which shows signs of aborting. In dairy cattle we recommend that all cows calve in specially constructed maternity stalls and be kept in these stalls or maternity lots separate from the rest of the herd until they have passed a negative test three weeks after testing. This would not be practical in the average beef herd; therefore, it is most essential to remove all reactors from an infected herd before they calve in the herd and so spread the disease among the non-infected cows. Tests every thirty days from the time the calf is weaned until the cow calves again should detect practically all the infected animals. Any good stockman can eliminate Bang's disease from his herd if he will mix cow sense with the test and not assume that the first test removes all infected animals. There has been much discussion about vaccination against Bang's disease, especially of the use of vaccine prepared from the strain of bacillus abortus of low virulence. I am not a veterinarian and cannot enter into a technical discussion of vaccination which is still in the experimental stage, but I will quote directly from a statement which was prepared by Dr. W. E. Cotton, superintendent of the United States Department of Agriculture, Animal Disease Station at Beltsville, Maryland. "This method can no doubt be made to be useful in combating Bang's disease but until we know more about it, it is believed that its use should be confined to herds proved by the agglutination test to be infected and in which other modes of control are impractical.

"Involving, as vaccination does, the use of the living germs of the disease, it should be used ony on non-pregnant cattle and should be administered only by persons familiar with and trained in the precautions that should be taken in handling living vaccines. Its action is

preventive, not curative; hence, it cannot be expected to benefit animals already infected.

"Since vaccination causes animals to react for a time, its use would interfere with other plans of control based on the blood test and possibly shipments of cattle interstate.

"Results of experiments indicate that the use of a vaccine prepared from a strain of Brucella abortus of low virulence, especially if confined to calves, reduces the length of time that the induced reactions persist and lessens the danger of the vaccine more or less permanently infecting the animals."

PRESIDENT STABLER: If there are no questions, we will next hear about "Four-H Live Stock Developments in Maryland in 1936," by Mr. Mylo S. Downey, College Park.

4-H LIVESTOCK CLUB DEVELOPMENTS IN MARYLAND IN 1936

By MYLO S. DOWNEY, College Park

Mr. Chairman, Ladies and Gentlemen:

I have been asked to report on the 4-H Livestock Club developments during 1936.

We had what we considered three very successful colt clubs in this State; one in Frederick County, one in Talbot County and the other in Washington County. Seventy-eight colts were exhibited at three shows held by these clubs. There were classes for both foals and yearlings. Each club held a horse-judging contest in connection with these shows. The awards were given on a basis which included scores from the horse-judging contest, the placing of the animals, and the manner in which they were fitted and shown.

It was the first year, to my knowledge, that very much effort was made in lamb feeding club work. Harford County took the lead and brought to the Baltimore Livestock Show 44 lambs fed and fitted by fourteen 4-H club boys. Baltimore and Carroll Counties had several boys exhibiting lambs also. Maryland boys were very successful in competing with boys of other states and had both the champion lamb and champion trio.

We did not have as many baby beef club exhibits as we had hoped. In fact, there was a total of 13 exhibited by club boys from Howard and Baltimore Counties. The prospects look considerably better for a larger exhibit during 1937.

A beef cattle breeding club was organized by 4-H club boys in Garrett County. This is the first of its kind in the State.

Twelve or thirteen boys from Carroll County exhibited fat swine at the Baltimore Livestock Show. This promises to be a popular activity among our 4-H club members in the future. The champion

barrow and champion trio of swine shown at the Baltimore Livestock Show were shown by Delbert Ebeling, club member from Carroll County.

Four-H swine club members of Washington County held a little pig club show in Hagerstown in connection with the Four States Livestock Sales Company sale. It is hoped that that show and sale can become an annual affair.

We held in connection with the Baltimore Livestock Show our first fat-stock judging contest for 4-H club members. Teams of three members each from 13 counties participated. This contest was won by the Kent County team. Theodore Redman, high scorer in the contest, was awarded a free trip to the International Livestock Show and National 4-H Club Congress.

Other Maryland boys to be awarded trips to the National Club Congress were Guy Nelson of Baltimore County for his outstanding livestock club work, Maurice Ahalt of Frederick County awarded by the Maryland Bankers Association for leadership in 4-H club work, and Grafton Timberlake of Harford County as a sectional winner in the Westinghouse Rural Electrification Contest.

We are formulating some definite livestock 4-H club plans for 1937. We feel there is a need for some more definite livestock breeding projects and an increase in the livestock feeding work. We are hoping to increase the number of 4-H club exhibits next year. We hope we shall continue to have the enthusiastic support of the stockmen of the State, and we need your counsel and advice at all times.

PRESIDENT STABLER: We are very grateful for the good work being done. We certainly do appreciate that. We hope it will continue in the future and take in a little broader field.

MR. J. C. CASH: When these boys whom Mr. Downey mentioned were going to Chicago they met—all except one of them—in my office, and Mr. Harvey and I gave them all the facts we could give them about going to a big Live Stock Show and what they could see. Most of them had never been over the mountains, and they had no idea of what a big Live Stock Show looked like. In order to get them to correlate their impressions of the show, I offered one dollar prize to the boy who would give me the best report in not over one hundred and fifty words of what he saw and what he got out of his trip to Chicago. It was very interesting reading to say the least. The boy who won the prize is a boy from Frederick County whom I have not met. I am going to ask that boy, Maurice Ahalt, to read his account of the show. I understand he is in the room.

MR. MAURICE AHALT: Mr. Cash has asked me to read this little story I wrote about our trip to Chicago.

"It is very difficult to say definitely what I enjoyed most about our trip to the International Live Stock Show and National 4-H Club Congress in Chicago. To begin with, the trip to Chicago was,

in itself, very enjoyable and interesting. I like to compare the farming methods of one community to those of others, including my own community.

"The 4-H Club Congress, with all of the wonderful entertainments and educational tours to places of interest in Chicago, pleased me most. I enjoyed very much meeting a lot of boys and girls from all over the country. It was hard to believe that some of them lived 3,000 miles away from us, after the week was over. It makes me feel grand to have attended a banquet in the main ballroom of the Stevens Hotel, which is the largest in the world.

"The part of the whole trip that I enjoyed most was the livestock show, and particularly the Matinee Horse Show which we had the privilege of seeing one afternoon. The several classes of saddle horses that were shown and judged were the first I had ever seen. I was very much interested in seeing this part of the show and learning at least a few of the reasons the judges have for placing one horse over the other. I live in a dairying community and riding horses are few and far between.

"This trip was a great experience to me, and, as I am too old for any active club work, came as a real climax to my club work. I sincerely hope that Maryland will always send delegates to this Club Congress and this great Live Stock Show."

I would like to express my appreciation for all you stockmen have done in Maryland for me, and for the other boys who went to Chicago; I am speaking for them as well as for myself.

PRESIDENT STABLER: We will now have a round table discussion of various topics and will start with "Horses," led by Mr. Edward Derr, of Frederick County.

ROUND TABLE—HORSES

EDWARD DERR

Frederick County

Mr. Chairman and Fellow Stockmen:

I do not know why I should be asked to talk on this subject. I am just a beginner in purebred breeding, and I look for advice to you older fellows with more experience. This is the first year I have been a member of the Maryland Stockmen's Association, and this is the first meeting I have had the pleasure of attending. I do not know how it is customary for you to proceed, but shall try to cover a few points.

A few years ago, draft horses were supposed to be a thing of the past. Farmers were buying tractors for their farm work, and prices for horses went down. The farmers just discontinued raising colts; it did not pay, and consequently there was a decided decrease in the number of colts raised. After a few years' time these tractors

on the farms began to wear out, and there were no little tractors coming along to take their place. The farmers began to realize that it was better business to invest their money in horses. They would do the same amount of work, and they could raise some colts to take the place of the older horses, and have a few to sell each year. Now, that brought about better times for horses, and today the demand is very good. At the present time I think the horse business is very good and will be good for years to come.

In the past few years quite a lot of purebred horses came from Ohio and other states. In Frederick County some 125 purebred stallions and mares were bought from there. Now there are 250 head of purebred horses owned in Frederick County. I am not very familiar with the number owned in other parts of Maryland. I do not have much time to get around, so I can only talk of Frederick County.

As an example of the interest being shown in draft horses now, at the State Fair held in Timonium last September, 60 head of draft horses were shown. I am told that this is the first time in ten years that this draft horse show was held, and it was a great success. I understand that the Board is going to put this show on annually in the future in a better way by making the place more attractive, and improving the stabling facilities. The show is only for one day for each breed of horses.

Another example of the interest being shown is the Fair at Frederick. Six years ago the horse show there was so poor that it went out of existence for lack of interest, and for a few years we did not have any horse show. Several years ago, when horses began to get a little better chance, and seemed to be coming back, the people took more interest, and Kenneth Clark asked to get this show started again. There was so much interest shown in it that the cattlemen complained about not having any chance, as all the attention was given to the horses. The past year there was the biggest horse show ever held there. Nearly 100 head of purebred stallions, mares, and foals were shown in classes before the judges. We had as judge Professor H. L. Garrigus of Storrs, Connecticut, one of the judges of quite a few of the bigger shows in the country including the Harrisburg, Pa., show. It all indicates a lot of interest in that show. I might say that the 1936 Ohio State Fair at Columbus which I, as well as a lot of the other stockmen in the State, had the pleasure of attending, was the largest Horse Show ever held in the United States. It was worth the time of any man to see that show. It is always a good thing to go to a good horse show and then come home and try to do better. Maryland was well represented there. Then the International Live Stock Show in Chicago was also one of the biggest shows ever held, ably represented by farmers from Frederick. Maryland men were not only there, but exhibited horses at these shows.

I would like to say something about cooperation among the purebred breeders. I think that purebred breeders should cooperate more with each other in salesmanship and advertising, more together as a whole by County or State. When buyers come in from other States, and cannot find what they want we might take them around and show them what the other fellows have. That is a help and that is what we want, to help them to buy what they want.

PRESIDENT STABLER: Thank you very much, Mr. Derr. Now, we would like to hear something from the other branch of the horse game, the thoroughbred breeders. Mr. C. W. Hockley, president of the Maryland Horse Breeders' Association, was not able to come as announced on the program, but Mr. Humphrey S. Finney, of Holly Beach Farm, Annapolis, will take his place. Mr. Finney is editor of The Maryland Horse, a very interesting new magazine.

ROUND TABLE—HORSES

HUMPHREY S. FINNEY

Anne Arundel County

I fear I cannot take Mr. Hockley's place. Up to last night he had expected to be here, but, unfortunately, business engagements came up unexpectedly, and stopped him.

The Maryland Horse Magazine wants to represent all branches of the horse industry. It was primarily started by the purebred interests, but the Association is very much interested in getting information from all breeders of horses whether purebred or grade. Maryland is coming to the front as a place for the really important horse men of the country. Some one asked Mr. Vanderbilt why he did not go to Kentucky, and he said, "I live in Maryland." Our sales, one sale of yearlings and one mixed sale the past fall, certainly have shown a lot better market than there was for a time in Maryland. I think our race tracks are in a pretty healthy state judging from the amount of money they have turned into Maryland. The number of new breeders coming into the State is continually increasing. Yesterday we received in our mail a letter from Los Angeles (I just happened to think of that) from a man who had chanced to see a copy of the Maryland Horse, and he wrote to us, "My wife and I are breeding horses, and we are coming east. Your magazine has interested us. Send us further information as to what you can offer." You see we are contacting the right kind of people.

That little magazine is a great part of my life. It tries to be representative of all breeds of horses, but the draft horse men won't help me. I go out and I try to get information. We received three letters during the past six months from people from the Middle West, "Why not publish a list of the draft stallions in your State?" I have been trying to get that information, but I cannot seem to get

it. The idea among those men is "Let George do it." As long as people do something for some people they won't do it for themselves. I think that right now we have good opportunities. Things are coming along now very well. Everything is getting brighter. Now is the time to strike. Let opportunity go by, and it may not strike again. It is nobody's fault but our own if that happens. I would like all of you men who have draft horses today to write down the list of the horses you have and let me have it, and I will publish it.

Another thing that was brought up was about the sales that you are putting on here in Maryland. The Maryland Horse Breeders' Association is interested in disposing of horses at these sales each fall, but there is no reason why the draft horse should not be sold there just as well as the thoroughbred and the grade horse just as well. We would all go and get the benefit. We would have more people there if you have two kinds of horses at a sale. It would draw more people for both, and both would get the benefit of the advertising.

I saw that draft horse show at Timonium last fall. The men that put that show on did a splendid work. Of course, such shows as Timonium have to have the racing to bring more people, and they have to have the midway to get the people to waste their money, but that horse exhibit showed people just what Maryland can produce—as good horses as any State of the Union, and I have been in a great many of them.

Dr. Welsh mentioned the blood test for pregnancy. That is a very important thing. You know when you breed, you start with this premise, when the stallion covers the mare, the stallion has done his job, but you cannot be sure the mare has really conceived. In perhaps 90% of the cases you are all right, but sometimes the mares are to blame, in many cases they are not. This test will show you whether or not they are pregnant, if it is tried some six weeks later. If you send a sample of her blood over to College Park you will get their opinion and know whether or not she is pregnant. I will show you where that is mighty valuable. A young lady had one mare, and she had bred her, and some six weeks had gone by. I went over and took a sample of her blood and sent it on to College Park and we found she was not pregnant. She had refused the stallion—she was a mighty cranky animal—that meant a difference of some $300.00. She was bred again and was settled all right.

Mention was made of the Frederick County Fair, and the good draft horse show there. That was excellent. Down in Southern Maryland they had a little draft horse show. We had it some time ago, but we dropped it for two years. This fall we started up again. We had one class in which we had 17 teams, and I believe we had about 60 head of horses, not all of them purebreds, some one class, some another.

Another thing is the cooperation that the Live Stock Sanitary Board offers, that is so seldom used by the horse men. You can get information there without its costing you one cent. The Sanitary Board offers a great deal of service of value to breeders.

Now, I think all the members of the Stockmen's Association get our magazine. I believe all of you are getting that, and in that you will find a little notice that we are open to receive members. If you want to become a full member it will cost you $10.00, but you can become an associate member for $2.00. All associate members get the magazine; there is no subscription price for that. If you want advice on any subject, we will try to get you that advice. Questions come up occasionally down at the Legislature, and if we can go down there with a membership of 5,000 we can have some say, but if we represent only 100, then we can not expect to be as strong. That magazine is your magazine. If there is anything you want to say, just write a letter to us, and we will be glad to publish it. I have got a number of copies here that you may see.

PRESIDENT STABLER: Thank you very much, Mr. Finney. I was not aware that your organization was interested in both light and heavy horses. I am sure you do edit a very interesting magazine. It seems to be doing very good work.

MR. FINNEY: If any of you have got a draft stallion and will send me a picture of him, we will put it on the cover.

PRESIDENT STABLER: We will now go into the Beef Cattle phase of our Round Table. Mr. Warfield is not here. We will ask Mr. W. A. McGregor to talk to us for about ten minutes.

ROUND TABLE—BEEF CATTLE

W. A. MCGREGOR

Kent County

Mr. President, Ladies and Gentlemen:

I have a few notes here, but the interest this morning seems to be around the marketing. I thought it might be interesting to tell you something of what we are doing with our Angus Association.

We have a very active purebred Angus Association in Maryland. Through this Association we put on our own little private show, bringing out 60 to 80 entries. Also we develop our auction sales. In Frederick we sold 43 head at $215. In Warrentown, Va., with Maryland cooperating, last October, we sold 53 or 54 at a $208 average. That was very satisfactory.

The interest in purebreds is certainly on the increase. I think every purebred breeder (I cannot speak for the breeders of Herefords or of Shorthorns, but refer to the Angus breeders), every purebred breeder in Maryland had a very successful year, and sold all

of their surplus cattle at very satisfactory prices. There is no question about the interest existing last year. Prices are higher, and it is easier to sell. The beef market is going up; it has reached $14.25 in Chicago, and, as the beef market goes up, the interest in purebreds also goes up. We are getting good prices and moving them out very freely. Certainly not enough beef cattle are being produced today in Maryland to take care of the demand. I have sold over 200 head during the past year, and I could not supply the demand.

I think we are in a particularly fortunate position in Maryland. We have good grass, good productive land, and a splendid climate. We are producing all of the roughages we need. The breeding herd is being maintained on the roughages produced at home, and that constitutes a very profitable basis.

I do not want to take up any more time. I want to emphasize the point that Mr. Finney brought out about the benefits from cooperation in the purebred business. Certainly it prevails in Maryland in the Angus business. We are very proud of our Association. We are really helping each other, especially the small breeders, to market surplus stock at suitable prices.

PRESIDENT STABLER: Next we will hear from Mr. Sam O'Sullivan about Sheep and Wool.

ROUND TABLE—SHEEP

SAM O'SULLIVAN

St. Mary's County

At the time that I came to Cremona Farms a flock of 35 grade ewes were on the farm. These ewes showed a tendency toward being Hampshires more than anything else. During lambing season considerable care had to be taken because the lambs were so large that some of the ewes had difficulty in delivering. That summer a decision was made to use Southdown rams instead of the breed we were using. At the time the rams were bought, seven purebred Southdown ewes were included in the purchase. With the ewe lambs saved this gave us a flock of about 50 head.

During that winter I had an opportunity to buy a flock of 50 purebred Southdown ewes at a very reasonable price. These ewes were in very poor condition for lambing and considerable loss resulted. However, we saved a 100% lamb crop. From the sale of lambs and breeding sheep we paid for this flock the first year and still had our original number.

Our ewes are turned into good pastures about the middle of July, and the rams are put with the different groups at this time. In Southern Maryland it is dependent on the weather as to when our

lambs start coming. If we have a hot late summer, the lambs will be late. But if the late summer is cool our lambs will start during the latter part of December. The rams are changed from one group to another every thirty days. In my experience this has proven very satisfactory; of course the ewes are so divided as to mate them to the rams that we think will make the best lambs.

The ewes are brought into the field at the sheep barn between the first and middle of November and all rams are removed except the main stud ram. He remains with the entire flock until the first of December and is then put with the other rams in another field. This group consists of ram lambs, yearlings and the ones used for breeding. They are fed some hay and grain during the winter and early spring to keep them in good condition and to prepare them either for sale or breeding.

When the ewes are brought to the barn, they are fed about one-half pound of grain per day until just before lambing when this amount is increased to three-quarters pound per day. In addition, they are fed alfalfa hay in racks in the barn. In clear open weather during the winter they are allowed to run on barley or rye pasture during the day. There are two reasons for this: first, the feed that they are receiving is more or less dry and the green pasture seems to keep them in better condition; second, the distance they walk to these fields provides exercise for the ewes. In bad weather, fodder is put out in the field a good distance from the barn to provide exercise for them. During lambing season someone is with the sheep practically all of the time. This has enabled us to raise practically all of the lambs born. The purebred lambs are kept in individual pens with their dams until they are three or four days old and then are ear-tagged and turned out with the other lambs. As soon as the lambs begin to eat they are fed a mixture of corn, oats and bran with a small amount of linseed meal. Our method of feeding the lambs is in a creep. So far we have not had any difficulty in getting the lambs to eat. The lambs are castrated and docked between the ages of seven to ten days; in my experience this has proven to be the most satisfactory age for these operations.

Our lambs are marketed between 60 and 70 days of age at a weight of 55 to 65 pounds. At this age they are choice finished lambs. Our market is possibly different from that of most sheepmen in that we have an agreement with one restaurant to take from three to five lambs each week weighing between 55 and 65 pounds and of choice quality. This will be the fourth year of marketing our lambs in this way, and it has been very satisfactory.

I would like to say a word about our reasons for selecting the Southdown breed. We have a very specialized market that calls for a small lamb finished to the nth degree at a light weight. The Southdown answers this requirement in that they are choice from the

time they are four weeks old right on to maturity. They make rapid gains, distributing the finish all over, and when they reach market at 60 to 70 days of age, they are choice. On several occasions we have shipped lambs at 60 days of age weighing 60 pounds. Southdowns as a breed are very uniform, easy to handle, and are the outstanding mutton breed. In conclusion, I think that lamb production has a very important place in the livestock industry of Maryland and, when handled as all livestock should be, will return excellent dividends for the amount invested.

PRESIDENT STABLER: I might say that we heard this morning of a good lamb exhibit at the Baltimore Show.

Mr. John Muncaster will next speak to us about Sheep and Wool.

ROUND TABLE—SIXTY YEARS WITH SHEEP IN CENTRAL MARYLAND

JOHN E. MUNCASTER

Montgomery County

I want to begin by saying that people began to make me a secretary when I was about fifteen years old, and I have been at it ever since; so without my minutes in front of me I really get lost and become as dumb as the sheep before his shearer. I suppose I should use up about four minutes telling you I am not going to take much of your time, and how much I enjoy the meetings, but I take it for granted you have all heard it so often it can be left out. This is going to be a life-time story of sheep and sheep incidents, and you can believe as much of it as you choose.

Sheep are, most of them, innocent sort of animals, but they have much individuality if you stay with them, as I have have, for three score years. At about the age of seven, my father started me and a younger brother feeding the sheep. There were about 25 of them I suppose, but it is too far back to really remember. I know, though, that we were such youngsters that each feed of shelled corn was put into a sack, and all we had to do was dump it in the trough and watch them eat. They were kept in the driveway of a barrack, afterwards being moved to a shed roofed with straw to get them away from the hogs. This shed was large and well drained. The sheep could always keep dry in rainy weather if they worked it right. About the time it stopped raining outside it would commence to leak inside and all they had to do was to go outside when it stopped raining. The first sheep I ever owned was a bottle lamb which I and the cook fed. It was kept with the rest and the lambs and wool were sold separately, and formed the beginning of the live stock fund. Since then I have never been without a few woolies on the farm, and we now carry from 70 to 80 on the home farm.

In those days lambs were produced in April and May, carried through the summer, and put on the market some time in the fall. Ewes were cross breeds, from the mountain sections of Virginia or West Virginia, bought in at about $3.00 each. They were kept for two years, by which time they would have fattened up a lot, and brought, maybe, as much as $4.00. I remember well the first lot of lambs we sold by weight. I was about sixteen, and my brother and I drove them to Bennings stock yard, about 30 miles, leaving home about daybreak. The road from 15th and H St. to Bennings at that time was three miles of dirt with a stream of water running in each gutter, and the way those lambs did drink from those gutters all the way was nobody's business. They were sold to a fat German butcher who lived in Washington and when we presented the weigh bill, he looked it carefully over and with the remark, "My! They vay heavy!" handed over the cash.

Running back over some farm books, prices received for lambs in the past may be of interest. I find in 1901, lambs averaged $4 each; in 1910, $5.36; in 1919, $10.39; in 1924, $8.36; and in 1936, $9.36. Between 1901 and 1910 they were sold in a bunch along in October; since then they were put on the market as they reached 65 to 75 pounds. We aim to get them all away by August, but usually have a load of late comers, non-growers or slow growers to go along in late October after the grass gets frosted. There seems to be no object in carrying lambs on grass that the ewes will use during summer, when they will give as great returns in money by going away sooner.

Sheep in our Montgomery County climate need no elaborate shelter, but they will not do much on fresh air, scenery and weeds. They will soon make a blue grass sod of any field they are kept on, and there was a field on the farm I was raised on that had sheep run on it for 40 years without any trouble. It was mostly highland with a stream through it. On low, flat land there is more or less worm trouble but, if taken in time, there are many remedies for internal parasites which may be used with good results.

Many of the flocks in our county are kept in a part of the basement of the big barn, but this is not an ideal shelter as there is not enough sunlight, and we hear of many more lambs being frozen in the basement than in the open sheds. I like a shed not over 16 feet deep, 6 to 7 feet high with a hay loft above, making sure there is a tight floor so seed will not sift down. It should be open except for a return on each end of 6 to 8 feet, to prevent the whirling in of snow during winter. About one foot in length for each sheep will prevent crowding in spring when the flock is doubled with lambs. The ideal ground plan is an ell, with the open side to the southeast. The return in the north and south leg can be made into a room to be used as a hospital and maternity ward, and should have a long

glass window towards the south, to catch the winter sunshine. This room can be divided as needed with hurdles about 3 by 4 feet, hinged in pairs. We usually hinge with wire, as it is cheap and convenient. For winter lambs with us, no other shelter is needed. The only thing absolutely necessary is to make the building draft-proof at the floor line on the north and west sides. Of course, we don't have all this at home. The sheep shed is partly the basement of an old log barn built about the time of the Revolutionary War, with a 16 by 40 shed added to the south end. We have lost very few early lambs in it, though.

About 1900 to 1905, I had been doing pretty well with Berkshire pigs, purebred and registered. Had a good trade in the south. Without bragging, I can can say I sold more registered Berkshires than any other Maryland breeder for a couple of years. This was before the day of state veterinarians. After the Southern states accumulated those officers, health certificates at $1 to $2 each had to be forwarded to the state veterinarian before shipment, and, when approved by him, went with the pig. It took about a month to get the papers, and I sold a pig and shipped a hog. It did not apply to sheep at that time so I started a small flock of purebred Shropshires. We did not have any ram sales then to push them, and I soon had a bunch of good rams on hand with slow sales. Advertising did not seem to help, so I went back to market lambs. With the purebred flock I found the same trouble we still have. They came in later and later every year. Breeders wanted a big early lamb for small flocks or a well-grown yearling. The ewes were easy to keep fat, and in spring we would lose some every year from getting flat on their backs and not being found in time. I got a good offer for them and sold them off, but kept on using the purebred rams. My son started helping with the sheep about the same time he started for school and he collected a Shropshire flock of his own, which gets the same treatment as the grade flock. With modern conveniences he has done well with them.

We keep our flock up by selecting some good ewe lambs every year, enough to replace those that are lost by death, accident, or design. They are much better than any that can be bought in the market. About one-half lamb, when yearlings, but they give less trouble on the farm. They are used to the runs, and do not require as good fences as one of the wild ones that comes from some outside range, and that may have been breaking bounds ever since it was yeaned. Most of our fences are old Virginia worm fences that are so tied down with honeysuckle, poison oak and greenbriers they cannot blow away. Forty-five inch woven fence makes up most of the rest, but we have several stretches of five barbed wires that are just as good as the other fences. Barbed wire must be kept tight, and if sheep do go through it must be restretched, and a few panels adjoining the break stayed with cross wires.

I was managing one of the family farms along in 1920-22, where beef cattle had been one of the main sources of income for many years. We were caught in the market drop of those years to the tune of $500 or $600, besides the feed. I had suggested to the tenant that we stock up with sheep but he would not until a couple more bad years made him want to keep no more cattle for company; so we paid $600 for 50 sheep. These were largely grade Dorsets with a few registered ones carrying the ear tags. We got no papers, of course, but the ram that came with them was a grand sheep. He had a spread of horns of about two feet, and they must have weighed 50 pounds. When a man moved out of the corn house with a basket of corn on his shoulder in sight of that sheep, he had to have a body guard. When old man Dorset saw him coming, he would creep up behind him and upset him and the corn basket sure, then proceed to fill up as fast as he could. He never attacked any one at any other time and we kept him for several years and sold him to a neighbor. About one-third of this flock would lamb from December to February and produce a second crop of lambs in July and August. About $800 was divided with the tenant annually for lambs and wool, and the flock was kept up to 50 by raising lambs. Dorset lambs grow fast, but ours were long-legged and always looked slim. There was a cut of at least half a cent a pound in the market, but that made little difference on 80 pound lambs at 15 to 20 cents.

The flock runs on pasture without grain for seven or eight months of the year. For winter, 70 or 80 consume 8 to 10 tons of clover hay. If there is not too much rain before hulling, clover haulm is used, and they do well on it. We tried soybeans, and they relish bean hay like all other stock, but unless it is put away early before the beans mature, it is a dangerous feed, as I think some of you have found out. When we first fed it, we lost a number of sheep apparently in perfect health, and never would have found what was the matter if the animal husbandman from College Park had not sent a man to make a post mortem. The grain allowance we use is about one quart per day for each animal, given in two feeds. Barley is our standby now, but oats, shelled corn or ear corn are just as good. Ear corn comes in handy when laziness or want of time prevents using the sheller. No feed for sheep needs grinding, and access to ground feeds will often cause losses. Not very long ago, the flock got into a hog feeder on the farm with a loss of nine dead, and a lot of sick, which took some time for recovery. When the corn-and-cob crusher came into vogue, my father had a lot ground for the sheep, and within 15 minutes after it was put in the trough the first time there were four or five dead. Probably a gradual change to the ground feed would have been all right but the experiment was not tried.

Dogs. When we moved to the present farm from another neighborhood where dogs had been made safe for sheep, we were told we must

pen the sheep every night if we wanted to have any, but we never did. We have had losses from dogs three times in seven years, twice just after a fox hunt in which hounds from all over the State took part, and once from local dogs. Fox hounds will not usually disturb sheep, but once in a while some stranger will have dogs that have not seen sheep, or dogs get lost from the hunt and remain in the neighborhood as strays, get hungry and kill a few. Last summer our Master of Fox Hounds sent some young dogs out with his whip for a trial run. They went into the flock and ruined two. The M. F. H. paid for them and said he killed the dogs.

The sheepman was a law unto himself before the day of dog taxes, and woe betide a stray dog going across the place. A load of No. 8 shot properly placed did not kill, but it made things so hot that dogs used to do like the old time hobo, they put a chalk mark on the gate and went around the place when they wanted to be on the other side of it.

Montgomery County had the first dog tax law which was workable, and it is the same as the state-wide law now. George Waters went to the House of Delegates with it in his pocket, having made the campaign on that one point. He was about 80 years old, and he had men less than half that age for his fellow delegates from the County. One of them was Cy Cummings who was afterwards well known all over the State. Cy said he had to change his seat in the house because he heard so much about dogs he felt he had fleas, but his help in getting the law passed was real. Some of the citizens refused to pay the license, and one of them told me he had assurance that if he made a test case others would give financial support. He made it. It cost him over $100, and he paid the $1.00 license, but he has not seen any help yet.

The original law paid the collecting constable 25c for collecting $1.00 tax, or 50c for killing dogs. He carried a gun and usually killed more than he collected, so the dog population got down to a reasonable number and has remained there. Some sections are still bothered with dogs that kill sheep and are still at large, but usually they do not last long.

I knew but one lot of western lambs to be fed in my section. Losses on the carload began before they were unloaded and never stopped while any remained alive. There were a good many of those 40-pound lambs that Mr. Carmichael was looking for last year for a feeding test, and could not find. It struck me then, that no sheep man in Maryland had any business with 40-pound lambs on his farm in August if he was raising sheep for profit. There might be one or two, accidentally, but no more. This feeder after totaling up his losses from shipping, accidents, disease and unthriftiness, damage paid his neighbors, and wear and tear on temper, was in the red badly without counting his feed.

I knew a lady once who had a son that thought himself up and doing and up-to-date. She said when she was born, she did not know much and had to learn everything, but when Paul was born he knew everything she did and had never learned anything since. I must say I do not match him for I have never seen a time when I could not pick up a few points from all kinds of folks, and I am closing with the idea that I am going to get some from you folks here today to add to those gained in former years.

PRESIDENT STABLER: The next subject is "Hogs," and it will be led by Mr. Fred C. Ernst of Washington County.

ROUND TABLE—HOGS

FRED C. ERNST

Washington County

From whence have we come and where are we going in the hog business? I know that most of you are not nearly so much interested in the floods that have gone under the bridge as you are in the droughts and floods above the bridge.

The history of the past has recorded literally and figuratively many droughts and many flood periods in the hog business; most of you are not likely to forget the World War prices of 21 cents per pound for market hogs and the $1,000 to $50,000 for herd boars. We were enthusiastic then, but our enthusiasm was based upon intoxication, and I am told that genuine intoxication is followed by a headache. Our hog producers got their last jubilee headache in about 1933 when market hogs were selling at about 3 cents per pound and you could not give away a herd boar, even with a dollar-bill tied to his tail.

I have an idea that when our forefathers laid the foundation for our present swine industry, they could have predicted some of the things that have happened to us. Furthermore, I believe we of today can predict some of the things that may happen in the future. In spite of all we can do to enlighten younger generations they will still permit themselves to become intoxicated with inflation and the false impression of prosperity which it engenders.

The pages of our swine history in the United States are filled with accounts of achievement. At the same time, they are filled with records of economic pressure and relief periods which, if heeded, would be of great value to the present and future generations of swine growers.

Let us consider some of these achievements of the past. When the early settlers of this country set themselves down to agricultural pursuits, the hogs they had were of a nondescript sort, coming from many parts of the old world. Needless to say that an indiscriminate mingling of these bloods led to deterioration, and the hogs owned by

our early settlers were little, if any, better than the wild hog. Practically no thought was given to the feeding of these hogs, as the mast, herbs, roots, and vegetation constituted a bounteous supply of feed.

As time went on and the mast-producing trees were destroyed to make room for cultivated fields, the natural source of feed for swine became more and more scarce. Furthermore, as the country became more industrialized, a demand for pork arose from a unit of the population which had no means of producing it. Therefore, the farmer found an attractive outlet for his surplus pork that beechnut production and shotgun slaughter failed to meet.

This, of course, brought to the attention of the early settler the necessity of using cultivated crops for swine feeding. It was very quickly learned that the then existing type of hog responded very poorly to the feed given it.

This started the ball of swine improvement rolling. I might add that it grew to mammoth proportions in the rolling process. The American breeder has always been inclined to extremes in his breeding operations. Due to existing conditions the early breeders went in for the fat pork and easy feeding type of hog. Breeders tried to outdo each other in producing a type representative of a bundle of lard and quick maturing qualities. Then the concentration of too much fat and lard was felt, and breeders awakened to the fact that the important functions of reproduction had been impaired through too great a concentration of favored blood-lines and through the addition of too much fat to their hogs. It was then that they started in the other direction toward great stretch or mammoth proportions; some strains resulting from this effort were spoken of as being "so near heaven they were no good on earth."

Approximately one-half of the success or the failure made with livestock is due to the producing ability of the breeding stock used. The other 50 per cent of the returns from the handling of stock is checked against the feeding and carefulness of management. No matter how skillful the feeder or how painstaking the care, inferior breeding stock will not give maximum returns. Likewise, high-class breeding stock given indifferent attention in feeding and management cannot live up to its possibilities of profit. The ambitious and intelligent man merits the ownership of good livestock, and it will give him greater profit than common breeding stock. The negligent owner will lose more money if he has good livestock than if he handles scrub animals.

Selecting the most profitable type of brood sow is a difficult matter and requires years of experience. It is not possible to use any mathematical standard in selecting these mothers of the pig crop.

The thing of primary importance is knowing what we are after, not so much what we like, as what we should produce. I believe that commercial hog raisers are influenced too much by what the

packers say is the best type. Packers are very likely to change their type with great rapidity according to current meat and lard demands. Swine breeders who build their type after a pattern of conservatism and sound policies cannot be rearranging it according to every change and whim of the packer or consumer demand. Furthermore, I believe that packers will eventually be forced to the buying of their hogs on cut-out carcass values rather than on the present index of carcass yields. We all know that an extremely fat 220-pound hog will have a greater dressing percentage than one of the same weight carrying less fat. But on the other hand the hog carrying less fat will probably have a greater cut-out value. This, of course, will be due to the relatively low price of lard. I believe it is the meat type of hog that we are after, and we should select our breeding stock with this in mind. A good brood sow is one long in body with a strong back and strong feet and legs. Long-bodied sows usually have larger litters of pigs than do short-bodied ones. It is preferable to select sows from large litters. The loss from crippled hogs at the large markets amounts to a considerable sum. Much of this loss can be prevented by selecting breeding stock with strong feet and pasterns. A good brood sow always has a neat head and neck. This is an indication of a good mother.

A smooth coat of hair, absence of wrinkles in the skin, neat ears, and clean bone are indications of quality in hogs. High quality is of prime importance. Coarse, wrinkly, soft fleshed, flabby jowled hogs sell at a big discount.

A large, thrifty sow will usually transmit these characteristics to her pigs. Growthy pigs which gain rapidly are the most profitable kind to raise; hence a vigorous, active sow, large for her age, is a good choice when selecting a brood sow.

Any man who owns two or more brood sows cannot afford to neglect to follow some simple plan of selection. This is just as applicable for grades as pure-breds. Weighing each litter separately at 60 days of age is just as accurate in determining the producing qualities of a sow as weighing litters at marketing time.

Ordinary breeding stock and indifferent care produce pigs which sometimes are profitable, but in most years are sold at a loss. Well-selected brood sows, plus a good sire and intelligent feeding and management, raise pigs which are money makers nine years out of ten.

I want to say in conclusion that the builder of type in hogs needs to consider the ability of the brood sows to transmit capacity to the progeny,—in other words, prolificacy and the ability to handle feed economically with the further ability to pass these characteristics on to progeny are the greatest assets a breeding animal can own; that the breeder should emphasize the importance of constitutional vigor in his hogs, which is reflected directly by deep, full heart girths, roomy middles, strong tops, sound legs and activity on foot; and that

the pure-bred hog promoter in building his type should give attention to the meat-producing efficiency of his animals. This involves not only pounds of pork for pounds of feed consumed, but it also involves the amount, distribution, and kind of meat which the animal can produce.

I believe that no breeder's job is worth while unless he can produce something of beauty which pleases the eye.

The pure-bred breeder needs to be ethical in his dealings. Do not misrepresent the age of your hogs in the show ring. Do not falsify pedigrees. Do not palm off inferior breeding stock on a buyer who is incompetent to recognize the lack of merit. Be honest in your advertising. Stand by your guarantees. Be a gentleman in your dealings, and do unto others as you would have them do unto you.

PRESIDENT STABLER: Continuing the Round Table subject "Hogs," Mr. J. Herbert Snyder, of Carroll County, will discuss another phase of the subject.

ROUND TABLE—HOGS

J. HERBERT SNYDER

Carroll County

Mr. President: Monday's market report in Baltimore showed top hogs selling for $11.45 while corn the same day was quoted at $1.11½ per bushel. Any discussion of feeding hogs at this time must necessarily carry these two items in mind. Many old feeders have said that you cannot feed cheap corn to cheap hogs and make anything, but that money is made by feeding high corn to high hogs. This is true to the extent that most of the cost of producing this corn by the farmer is his wages for his own labor and rent on his own land.

According to the Pig Crop Report for the United States issued December 1, the fall pig crop was 6 per cent above that of 1935 but 11 per cent smaller than the five year average. It also showed that there will be a reduction of 5 per cent in the sows to farrow this Spring. With a shortage of hogs and an increased consumer demand the hog business in Maryland must be good for the next year regardless of high feed. How has Maryland reacted to this situation? The fall pig crop was increased 21 per cent over that of 1935 with a prospect of 8 per cent in spring farrowing. This I think is good judgment. It but brings the hog back to its former position on the Maryland farm. First it was the dairy cow that supplanted the hog, and then three-cent hogs completed the annihilation.

I shall start with the market end of the business. This may be working backwards but after all the market is the court of last resort. What we produce and how well we produce it depends almost wholly on what our customer wants. A certain number of our hogs

may be sold for breeding purposes, but these must be the best. They must be of a popular breed, acceptable type, well grown and at a reasonable price. The price will be better than market price, but not excessively high. I believe that it is better to sell several fair priced animals to your neighbors to improve their herds than one excessively high to some fancier on a distant market.

Our market hogs in Maryland are marketed two ways, to our local butcher and to the large packer either directly or through some sales agency at the Baltimore Stockyards or the Four State Sales Co. at Hagerstown. Most of our local butchers kill only about six months of the year, from October to April. When this market is open it is one of our best. The price is based on top Baltimore price less from fifty cents to one dollar per hundred pounds. There is no cost of trucking, no commission, no shrinkage and no loss of hogs. This also works to the advantage of the small producer who has only a few hogs. The Baltimore market then sets the price for all of our hogs regardless of where sold. On those of us who sell on this market there rests the responsibility of producing a hog whose type, size, and condition will demand the top price and so raise the price for all the producers in the state.

I doubt if there is any set time when we should have our hogs ready for market. September is a good month. So are February, March and April. If producing for local market, your time of finishing is important, but the large packers buy the year round. Hogs from 175 to 225 lbs. top the large markets. Local demand does not want them under 200 and will take them up to 250 at top price.

We now have a market and Mr. Ernst is going to furnish us with good breeding stock. We are then going to have our sows farrow at a time that best suits our farm. We want those pigs on pasture as much as possible. March is the acceptable month for farrowing. We are usually getting over our bitter cold weather, pigs will be easier saved, and grass will soon be starting. Our sows can again farrow in September and the pigs will get a good start before cold weather. If these pigs are grown well they should go on the market as 200-pound hogs in September and March.

The sow should be well cared for, and given plenty of succulent feed and plenty of exercise. A thin sow will probably farrow weak pigs, and her body weight will not carry the pigs through the suckling period. A fat sow is lazy, clumsy and awkward and may kill her pigs. Milk fever in a fat sow may also cause loss of the litter. Care at farrowing time is of greatest importance. If you save only a small number of pigs, your business is doomed at the start to be in the red. The average litter for Maryland last year was about six. We should do better than this.

Get those pigs on pasture as soon as possible. Blue grass or alfalfa are both good. We have found a good practice is to fence off

a corner of the hay field sown with a mixture of timothy, clover, and alfalfa. This has an additional advantage of being clean. Disease and parasites have not been able to harbor there since last in pasture. Make as much use of pasture as possible. It is cheap and saves labor.

A good pig makes a hog of himself by eating. Regardless of the breed, regardless of the color or regardless of the fact that he may be by a Clansman boar, out of a Longfellow sow, no pig ever made a hog from anything else but feed. Get him to eating as soon as you can.

Corn is the standard hog feed and without it we would probably go out of the hog business. But corn alone is not a good feed. It is low in protein and deficient in mineral, especially lime. With corn high we will look for a substitute. Wheat and barley are the chief substitutes. Wheat at $1.40 per bushel is now more expensive than corn. The price of barley would permit substitution, but it is scarce and hard to procure. Oats can and should be used in the hog ration especially for sows and pigs, but it would not be practical to finish with oats alone.

For our protein supplement we can use animal sources such as tankage, fish meal or skim milk, or vegetable sources using oil meal, cottonseed meal, soy bean oil meal, or peanut meal. Tankage is the standard, but at present it is high and scarce. Fish meal is good and cheaper. To the farmer who has skim milk, this is the cheapest source of protein. Skim milk powder has not proven as good as the others and at the present time its cost is prohibitive. Crab meal has also appeared on the market in the disguise of fish meal. This can be used but it carries only about half as much protein as high grade fish meal.

From vegetable sources to replace part of our tankage and fish meal you can use oil meal. In addition to being high in protein it is a good conditioner and laxative. A mixture of equal parts tankage, oil meal and alfalfa meal has proven satisfactory in the west. A limited amount of cottonseed meal can be used with safety. Soy bean oil meal and peanut meal can also be used, but care should be taken that a grade low in fat be used as both cause soft pork. Soy beans, either whole or ground, should not be used.

Whether to use self-feeders or feed by hand is up to the individual. Self-feeders require less labor, the supplement can be put separate, and the hogs eat just what they want, and they will make faster gains. A good hand feeder who watches his hogs can produce cheaper pork with less feed. A combination of the two may bring the best results. Feed your supplement in a feeder, feed your ear corn by hand and furnish plenty of good clean water.

Now that pig should be a hog.

PRESIDENT STABLER: Next we will hear from President J. C. Cash, of the Union Stock Yards, on "Marketing."

ROUND TABLE—MARKETING

J. C. CASH, President Union Stock Yard Co.
Baltimore

Most people include in the word "stockyards" all the enterprises that take place on the market, and it might be well to explain of what a stockyards consists.

The Commission firms are the shippers' agents, employ the salesmen, pay the shippers' bills for freight, feed, and other expenses, and return to him the net amount due from the sale of his livestock.

The buyers are of three classes: Salaried, who are employes of larger packing plants, usually located in the same city; order buyers, who buy for a set commission at so much a car for small slaughterers or those located outside of town; and third, small killers who buy their own stock.

Packing companies are usually considered in the ordinary term "stockyards," but these companies kill, merchandise, and sell products.

The yard company owns the physical facilities and operates what might be termed a "livestock hotel," open 24 hours of every day in the year, for which we receive "board and room," namely, feed and yardage, the revenue which makes possible its operation. So in the common phraseology, and as commonly spoken, the term "stockyards" includes the commission firms, buyers, packing companies, and stockyard company.

The Baltimore Yards covers about 45 acres, employs 45 men who receive approximately $200.00 per day; taxes amount to about $50.00 per day; water about $13.00 per day, or a total expense of approximately $400.00 each day. In our yards, the pens are all covered with roofs, which total nearly a million square feet and make me wonder sometimes whether I am in the Stock Yard business or the roofing business.

With the advent of many small markets throughout the country, it might be well to explain the advantages of the posted market, but before doing that, it might be well to explain what a posted market is. Any stockyard containing 20,000 square feet or more is under the supervision of the Packers and Stockyards Administration. This has been an arbitrary size and of course may be changed at some future date. When trading at a small market, you only have the individual backing for confidence in square dealing. With posted markets, you have the inspection and supervision of every act. Some of the advantages which the posted market provides are the following: honest weights, inspected scales, thorough inspection, disease prevention, clean pens, the best of hay and water, bonded firms—licensed by Packers and Stockyards Administration, trained salesmen, many buyers, and competition.

There have been some customers at a terminal market who have been somewhat dissatisfied but I question whether they know what constitutes value. To me, an animal to have value must have conformation, which is shape, dependent primarily on breeding; finish, which is another term for fat and is the result of feeding; and, to bring satisfying prices, must have what the consumer wants, marketed when he wants it and has the buying power to purchase it.

Central posted markets, I am sure, warrant the support and cooperation of all the stockmen, and to this aim they are all striving.

(Following is the address which Professor Ikeler had prepared for presenting at the morning session, but which was not presented, on account of the lack of time.)

MARYLAND'S LIVESTOCK OPPORTUNITIES

PROFESSOR KENNETH C. IKELER
College Park

At the annual meeting of Maryland Stockmen it may be in order to ask ourselves what are the livestock opportunties in Maryland and are we living up to the advantages that the livestock business enjoys in this State?

The livestock business is a basic one to many Maryland farmers as it (1) furnishes a ready market for our forage and grain crops; (2) it affords a fairly regular cash income, and (3) by means of the animal manures, when they are returned to the land, they offer a practical method of maintaining soil fertility and crop production. Where the farm and farmer are suited to livestock and the markets and buying demand are at hand, no other system of farming has given better results.

Some of the principal advantages to Maryland livestock producers are: Our moderate climate and short winters and an adequate rainfall of around forty inches annually. This ample rainfall makes for dependable crop production and abundant pastures so essential for the success of the business. Much of the meat consumed on the eastern seaboard of this nation is produced under considerable handicap in the rain deficiency areas of the west, where the average rainfall is around fifteen inches annually.

It occurs to me that the advantages of being close to market in Maryland are sometimes not generally appreciated and understood by our stockmen. Permit me to illustrate what we mean. The eleven million people concentrated in the greater New York City area are more than the total population of the eleven western states combined. This consumer demand near at hand to Maryland livestock producers amounts in many cases from fifty cents to one dollar per hundred freight rate on western livestock. In adverse

years this margin in favor of eastern producers may be the difference between profit and loss. This is expressed by the western grower constantly asking for a reduction in freight rates so that he may hope to compete with eastern production.

The western producer may upon first thought seem to have had some advantage in the past in the free use of the public domain and in the seemingly low grazing fees paid for the use of the national forests. With the intricate problems of leasing spring and fall range and the increased cost of wintering their stock many livestock outfits are faced with increasing hazards. These have resulted in decreasing the size of the outfits that may be safely handled.

The advantages of ample rainfall with its abundant crops and pastures together with our nearness to market and the great meat consuming centers gives Maryland stockmen a substantial lead over the western producer of livestock. These advantages and opportunities are probably going to express themselves to a greater extent in the future than they have in the past. The pendulum is surely swinging toward the Maryland stockmen. I am sure they will take full advantage of their opportunties.

PRESIDENT STABLER: We will now call on the Nominating Committee for the results of their deliberations.

The following officers, members of the executive committee, and delegates were proposed by the nominating committee and were thereupon unanimously elected to serve during the coming year:

President.....K. A. Clark, Frederick County
Vice-President.....W. R. Harvey, Baltimore County
Secretary-Treasurer.....B. E. Carmichael, College Park
Assistant Secretary-Treasurer.....Jos. M. Vial, College Park

Members of the Executive Committee: J. C. Cash, Baltimore; Harry N. Cohen, Talbot County; William H. Cunningham, Washington County; Sam O'Sullivan, St. Mary's County; S. O. Jones, Howard County.

Delegate to Farm Bureau Federation.....J. Kieffer Funk, Washington County.

Delegate to Annual Meeting.....Wm. J. Hines, Montgomery County

Morning Session adjourned.

STOCKMEN'S ANNUAL DINNER-MEETING, 6.00 P. M.

PRESIDENT STANLEY P. STABLER, Toastmaster

The Annual Dinner-Meeting was held at Childs, and as usual was well attended. Before and during the dinner, Dr. Wm. R. Crawford, of Carroll County, attired in fitting Scottish costume, furnished in his interesting, artistic way a number of selections of real bag-pipe

music. This feature was highly enjoyed, as it was on a former similar occasion.

PRESIDENT STABLER: Ladies and Gentlemen, will you please come to order. I think that all of us have finished one important part of our dinner-meeting, and now are ready to proceed to other things.

We were supposed to hear a few words of welcome tonight from the Mayor of Baltimore. Mayor Jackson generally comes to our meetings, but has been unable to get here yet.

Dr. H. C. Byrd, President of the University of Maryland, is here, and we will proceed with our program. We shall be glad to have "Greetings from the University of Maryland" by President H. C. Byrd.

GREETINGS FROM THE UNIVERSITY OF MARYLAND

DR. H. C. BYRD, College Park

Mr. President, guests, and members of the Maryland Stockmen's Association:

I shall talk three or four minutes about the University of Maryland and its work.

About fifteen months ago I started a complete survey of the whole University. This survey involved every department, including the Negro School in Princess Anne. It was my thought to place before the people of the State of Maryland a complete picture of what we regard as a complete State University, simply and wholly to overcome objections and criticisms raised from time to time in the State by a small group who had a perfect right to know whether or not we were going to build in Maryland a State University that was going to become a financial burden on the State greater than the State could bear. This survey indicates no reason to have such an outlook, and certainly we are not going to do that. The results of this survey would have been announced some time ago had it not been that I am not at liberty to give information regarding the budget until after the Governor's message goes to the Legislature.

Actually we have reorganized a good deal of our work until today we are doing more work in the State of Maryland for less State money than we did five years ago; and a completed picture of the University of Maryland will find us not asking for millions of dollars for maintenance such as has been feared, but really asking for less money than we actually got under the Ritchie administration; so that we shall not become a burden on the State of Maryland. This survey will show that we are returning to the State of Maryland more money annually in savings in one project than the State of Maryland appropriates annually for the whole University. Gentlemen, the State of Maryland is not making a better investment, and never will make a better investment, no matter how long this State exists as a political entity, than it is today making in the University.

I am not going into detail. I wish I had forty-five minutes to give you the details of what we have done and are doing for the State. To sum it up, we are returning to the State in economic value more than the State is investing in our work.

When somebody tells you the State of Maryland supports the University, tell them the State is not supporting the University. The State is appropriating only 21% of the income that we are expending, far less in comparison than it is appropriating for certain other institutions in the State. I do not say this in criticism of other colleges. We do not want a false impression to get around among the people of Maryland as to how much money the State is appropriating for the University. The State of Maryland, you hear, is appropriating $2,200,000 per year for the University of Maryland. As a matter of fact, the State for all services is appropriating to the University of Maryland only $738,000 a year, a figure which is not more than one-half of what other States are appropriating for the same purpose.

The little State of Delaware, composed of three Counties, with one city, with a population of 250,000 against 1,600,000 in Maryland, is appropriating more money for the education of 916 students than the University is receiving for the education of 2,240 students; so that when somebody tells you the University of Maryland is going to bankrupt the State of Maryland let your answer be that the State of Maryland is getting far more from the University of Maryland than the State is putting into it. The State of South Carolina, usually spoken of as the most backward State in the Union, is appropriating $135.00 annually per student against $84.00 in Maryland for the University of Maryland. I want you to have these facts.

Now just one word about the livestock interests of the University. We began seven or eight or nine months ago to reorganize our work in this field. Nearly a year ago I stood in this room and pointed to a plan for a group of buildings for a Dairy Husbandry Plant. The money was not available for those buildings at that time, but the buildings now are under construction. While you are not as much interested in this as are the dairymen, still it is a link in the general program for the development of the livestock industry. These plans are going to become a certainty, and, besides this, we have acquired land for a dairy farm and also a farm for animal husbandry. We are making requests to the present Legislature for sufficient funds for their operation.

It is not going to be long before plans are put into effect for a general reorganization of our agricultural set-up, and we have every reason to believe we shall get much better results than in the past.

In conclusion, I simply say this:—I told you last year I was going to search the United States for the best available man to lead your work and when we got him, were going to place him in control. This

is what we have done. Upon him is going to be placed the responsibility for research, for teaching, and, in some measure, for law enforcement. We have this man, and henceforth I am not going to command; I am going to be the servant of the Department. I say to you that the man placed in charge has only to command me as to what I shall do in my efforts to help him, because henceforth as far as the livestock industry is concerned he is in command and I am only the first mate. That is our policy, the only effective policy that I know to get the most effective results. The man I refer to is here tonight, but has not yet appeared before this group. I ask him to stand up so that everybody can see him. I introduce to you Professor Kenneth C. Ikeler, new head of the Division of Livestock Industry of the University of Maryland. (Prof. Ikeler rose and bowed.)

One more word, I want you to understand that the University of Maryland is at your service. It belongs to the people of the State of Maryland. We want and welcome your advice. We want you to tell us what your interests are. We want to give those interests our attention. If we do not serve your interests, it will be because you do not tell us what you want.

The last word is simply this:—and I say this as a word of appreciation—I personally am very grateful to the men who are members of this organization for their help in the past year in attempting to reorganize the University of Maryland and place the livestock interests on the proper footing. Mr. McGregor, Mr. Merryman, Mr. Harvey, Mr. Cash—they are some of the many men of that type who have been of incalculable value in this work in every way. We want to help you build up your industry just as much as you want to build it. I thank you.

PRESIDENT STABLER: The next thing on the program is an address which was to have been delivered by Mr. R. C. Pollock, Secretary and General Manager of the National Livestock and Meat Board of Chicago. We are sorry that Mr. Pollock has found it impossible to be with us tonight, but we are glad that Mr. Redman P. Davis, Director, Department of Publication of the National Livestock and Meat Board, is here. Mr. Davis will now discuss "The National Livestock and Meat Board and Its Work."

THE NATIONAL LIVESTOCK AND MEAT BOARD AND ITS WORK

REDMAN B. DAVIS, Director Department of Publication, National Livestock and Meat Board, Chicago, Illinois.

Mr. President, members, and guests of the Maryland Stockmen's Association:

It is an unexpected pleasure that I am able to be here this evening and also that I was able to attend the meeting of the Association this morning. As your president has said, Mr. Pollock had every intention of being present to appear on this program. It was not until yesterday that he found he could not possibly make it on account of unexpected developments in the office. He has asked me to express his sincere regrets and to extend his wishes for a most successful program.

The subject assigned to me, as shown in the printed program, is "The National Livestock and Meat Board and Its Work." That is quite a big order, gentlemen, but I promise to hold the discussion down as much as possible. It should not take more than a couple of hours; and that reminds me of the old definition of a good talk. Probably most of you have heard it. It goes something like this: A talk should have a good beginning and a good ending, and the two should be as close together as possible.

Not long ago at a livestock meeting in one of the western states, the chairman introduced a representative of our organization who was on the program, and in so doing made this reference to the National Livestock and Meat Board: He said that down there in Chicago they have a National Livestock and Meat Board and he understood that this board is doing a lot of good work for the entire livestock and meat industry. Perhaps you would see nothing wrong with that statement, but we of the National Livestock and Meat Board are quick to take exception to statements of that sort. The reason is that the Board should not be considered as an organization "down there in Chicago." Every livestock man should think of the Board as his organization. It is your organization. It is the organization of the man who made the remark at this western meeting. It is the organization of every livestock man in the country. The fact that the Board's headquarters are in Chicago is immaterial. The Board must have an office somewhere, and Chicago was selected because of its central location. Except for the advantage of location, the office might just as well be in Baltimore or in San Francisco. The point can't be emphasized too strongly that the National Livestock and Meat Board *is* the livestock and meat industry.

In speaking of the Board's work, let's begin at the beginning. It was some fourteen years ago that the Board was organized. At that time the nation was experiencing a wave of anti-meat propaganda. Meat was being put in a bad light, all because of unscrupulous attacks on it by food faddists, diet cranks, and others. The charges made

against meat were without ground but, as is the case of attacks of this nature, were accepted by a great many people as being the truth. The various branches of the livestock and meat industry realized that something had to be done to put a stop to such propaganda, if meat was to hold its own as the center of the balanced diet, and increase in favor in the future. They realized that a program of education and research was necessary to bring out the merits of meat and to convey this information to the consuming public. A number of leaders in the livestock and meat industry got together, and as the outgrowth of a series of conferences, the Board was organized.

It was set up with a directorate of twenty men drawn from all branches of the livestock and meat industry. It will be of particular interest to you, I think, to know that the balance of power on the Board's directorate is in the hands of the livestock growers and feeders. All of the directors are appointed by the organizations of which they are members. There are thirteen representing the livestock associations of the country; three come from the marketing agencies; two from the packing industry; and two from the retail meat trade.

A few years ago hardly anyone in the industry could have visualized such an organization. Before the Board came into existence it would have been hard to imagine representatives of all branches of this great industry sitting around a conference table discussing the problems of that industry. In years gone by the livestock man, the packer, and the others concerned felt that their problems were their own, and had not reached the point where they realized that the problems of one branch were of real concern to all of the others. Time and the National Livestock and Meat Board have changed this attitude. The men of one branch of the industry now fully realize that there are mutual problems which can be worked out by the participation of all interests concerned, and that is exactly what the Board of Directors of the National Livestock and Meat Board is doing. This directorate meets twice a year, and is in complete charge of the operations of the Board. A stranger looking in on a meeting of the Board of Directors would be unable to pick out a packer, or a retailer, or a producer, or a commission man by listening to the discussion.

Now, how is the National Livestock and Meat Board supported? Briefly, this support comes from the livestock producers and the packers. There is a collection, a voluntary collection, of fifty cents a carload of livestock coming to market. Twenty-five cents of this comes from the producer or shipper, and the other twenty-five cents comes from the packer. The Board, we are proud to say, has the wholehearted endorsement of some fifty-six leading livestock associations of the United States. These organizations have passed voluntary resolutions year after year commending its work.

I have already covered in a general way the purpose of the Board which is to further the interests of the entire livestock and meat industry in every way possible. This means largely one thing, promoting the consumption of meat. The program of the Board may be divided into three major sections: (1) education on the subject of meat, (2) meat research, and (3) meat advertising.

Before going into a discussion of the various lines of activity, I want to emphasize the fact that the effectiveness of the program may be attributed largely to the wholehearted cooperation of a great many interests not only within the livestock and meat industry but without it as well. This cooperation is forthcoming from such organizations and institutions as colleges, home economics teachers, doctors, dentists, the United States Department of Agriculture, and a great many others.

First of all, it is essential that the Board have at its command a wealth of authentic information concerning meat, for without such information it would be impossible to conduct an educational program of any worth. It is a fact that there had not been a great deal of scientific research on meat in former years. There was much that needed to be learned concerning the product in order successfully to combat the insidious propaganda and to place meat on a firm dietetic foundation.

With that thought in mind the Board has entered into an extensive research program. Working through the National Research Council, the colleges, and the United States Department of Agriculture, there has been brought out a great deal of valuable information which has made possible a most effective educational program. We have learned a great deal more about the food value of meat than we ever knew before. We know today that meat is one of the best sources of high quality protein, and that it contains a wealth of other essential food elements. Just let me mention briefly some of the research projects for which the Board has been responsible.

At the University of Minnesota there was a project which established the importance of lard as a household necessity. A study at the University of Arkansas found that fresh ham, lamb and pork liver are excellent sources of vitamin G, which is so valuable in the prevention of pellagra. You are all familiar with the remarkable work on liver which established this product as highly valuable in the prevention and treatment of anemia. As a result of this research work, liver has really come into its own. Thousands of lives have been saved. Where in years past a dealer threw in a piece of liver with an order of meat, today he throws in a piece of meat with an order of liver. That is a little exaggerated, of course, but you all know what has happened to liver on the retail market.

Right along this same line, that is the study of anemia, the Board

sponsored an exhaustive study to determine the value of meat in the treatment of anemia among children. A large group of school children was selected in Chicago. These children were attending a grammar school in one of the poorer sections of the city. The children selected were divided into two groups. One was fed a diet containing meat, and the other a diet furnishing the same food elements but without meat. A large percentage of these children were suffering with anemia. The results of this study showed conclusively that the children on a meat diet improved materially while the others continued to suffer from the anemic condition.

Another research project which has an especially popular appeal is that concerned with reducing. You realize, of course, that this subject of reducing is a very important one, especially in the eyes of the ladies. Anyone entering a program to take off weight has always been looked upon more or less as a martyr, for the general idea is that in order to take off weight a person practically has to starve himself. We have found out that this is not true. The Board has been responsible for developing a reducing diet which makes it possible for the person on the diet to eat liberally, and especially to eat plenty of meat.

The study was conducted at the Rush Medical College in Chicago under the direction of Dr. Leo K. Campbell of that institution. Dr. Campbell had done some work in the reducing diet field based on the theory that the most effective reducing diet was one in which the protein content was high. When we say a high protein content that means plenty of meat because, as I have said before, meat excels in this element. A large group of patients was put on this diet. They ranged in age from fourteen to sixty years, and came from various walks of life. On the high protein diet, in which they were allowed meat three times a day, they lost an average of ten pounds per month. They continued in their normal activities and did not carry on any additional exercises. These people said that they felt better than they had in a long time, and examination showed that their health actually improved. This reducing diet study naturally has attracted a lot of attention. We receive many inquiries from overweight persons in all parts of the country who would like to take off weight. By pointing out that such a diet is effective, the Board has opened another outlet for meat products.

Now while I am still on this subject of research, there is just one other study that I should like to mention. As a matter of fact it is one of the most outstanding undertakings in the field of research, not only in meat research but in any other line. This project is known as the Cooperative Meat Investigations. It was fostered by the Board a number of years ago and has been under way in some twenty agricultural colleges and the United States Department of Agriculture ever since. The Board saw the need for more information as

to the factors influencing the quality and palatability of meat. As one director of the Board said, we must know more about what is under the hide. The work under way in the colleges and the Department of Agriculture takes into consideration all phases of the subject of meat from the producing through the actual cooking and tasting of the product.

The cooking phase of this study is of especial interest. The meat from the experimental animals is cooked in various ways. Then it is tested for tenderness, juiciness, color, flavor and other characteristics. Thousands of ribs of beef, loins of pork and legs of lamb have been cooked in these tests by different methods.

As a result, many old ideas in meat cookery, passed down from one generation of housewives to another, have been discarded. New methods have been adopted, which make meat cookery simpler, more exact, and less laborious.

Much important information concerning meat has been revealed as a result of the research program. But information of this kind is valueless unless it is put to work. It must be brought to the attention of the nation's housewives, retailers, students, and others. A number of years ago a survey showed that the average housewife knew less than six steaks and roasts. She was buying meat largely by guess. The Board at one time made a survey to find out what attention was being given to meat study in high schools and colleges. The survey showed that in a large number of cases, little or no attention was being given to the subject, and in many schools the use of meat substitutes was being taught.

The need for an educational program to reach housewives, teachers, and others with the true story of meat is evident. The Board is carrying on such a program. One of the ways in which housewives are learning the newer facts about meat is through cooking schools conducted by the Board. By means of these schools, more than half a million women were reached last year with instruction on how to buy and cook meat, and were given the facts on its high food value.

In the cooking schools this year, 56 different meat dishes are being prepared. In addition, the foods to serve with these dishes are also considered. The women learn, for example, that searing does not save the meat juices, but actually increases the loss of these juices, which is contrary to the old belief. They learn that if you cover a roast it becomes a pot-roast, and that water should not be added to the pan in roasting. They learn that in broiling a steak, it need be turned but once. They are made acquainted with the fact that tender cuts of meat should be cooked by dry heat and the less-tender cuts by moist heat. These housewives learn that high temperatures waste both meat and fuel, and that lower temperatures and longer time in roasting, result in a more attractive and appetizing dish.

The retail meat dealer is the ultimate salesman of the livestock and meat industry. A keen knowledge of all phases of the subject of meat is important to the dealer, if he expects to merchandise this food product with greatest efficiency.

With the present-day keen competition among foods, the meat dealer must be thoroughly versed in the question of food value and in modern merchandising methods.

The Board, recognizing these facts, is carrying on a program with retail meat dealers to help them sell more meat. Over 35,000 dealers from 950 cities of 32 states attended the Board's merchandising lectures and demonstrations during the past year.

At these lecture-demonstrations, retailers are given new ideas on meat cutting to speed up the movement of the less-demanded cuts. They are assisted in the problems of figuring percentage, making cutting tests, pricing retail cuts, and in planning window and counter displays. They are given new meat cookery facts, facts on the food value of meat, etc. They are also given pointers relative to meat advertising as a means of stepping up sales.

The nutrition program of the Board is one of its most important activities. In this work we are reaching the medical profession, dentists, dietitians, and nurses with the latest information on meat, and also are bringing this information directly to the attention of the consuming public. The Board has established close contact with over 20,000 doctors and dentists, and as a result these professional men are receiving material on meat regularly. Most of this material is going out to them at their request. They are vitally interested, and we are constantly receiving inquiries from doctors and dentists regarding various types of information concerning meat as a food.

One of the most outstanding pieces of educational material in the nutrition field are the food value charts published by the Board. Today these charts are in use in over 5,000 high schools of the United States, and are in great demand by doctors and dentists who are using them not only for display in their offices but for instruction purposes in class room work.

These charts depict in a very graphic form the food value of a long list of our common foods. There are six charts to the set, protein, phosphorous, iron, calcium, calories, and vitamins. The various foods, as sources of these essential elements, are presented on the basis of the amount of these elements supplied in an average serving. The charts show in a striking fashion that meat heads the list of our common foods as a source of protein, phosphorus, iron, and calories, and that it is a much better source of some of the essential vitamins than was previously believed.

The calcium chart, however, shows meat far down the list; and in connection with this chart I should like to say that in my opinion it is the best meat salesman of the entire lot. True, it does not

present a good picture for meat, but it shows conclusively that the National Livestock and Meat Board, in compiling these charts, was entirely unbiased. It shows that the charts are compiled entirely on the basis of scientific facts. That the set of charts is entirely authentic is borne out by the fact that they have the endorsement of the American Medical Association.

Just a few words about meat exhibits. The Board has found that exhibits serve as a very effective way of teaching the subject of meat to the consuming public. During the past season there were in place twenty-two exhibits of this sort at livestock expositions and fairs, extending from Springfield, Massachusetts, to San Francisco, California. It is conservatively estimated that five million people visited these exhibits. The set-ups were of several different natures: Fresh meat exhibits were shown, other displays told the story of modern cooking methods, still others presented the food value of meat. The story of meat in the reducing diet was an especially popular feature. I was very much interested in observing the attention paid this type of display during the year.

Radio is playing an important part in the Board's work. While our budget is a modest one and we are not in a position to carry on a sponsored radio program, we find that a lot of radio stations throughout the country actually want material that we can supply concerning meat. As a result of the Board's service to these stations, and also the talks given by members of our staff from time to time, over 6,000 radio talks on meat were broadcast during the past year. These talks went out over 204 stations in 45 states. Of course, it is almost impossible to estimate the number of listeners, but we have been able to check on the interest being manifested by offering various pieces of meat literature over the air. When you consider that a single talk brought over 4,000 requests for a recipe, it seems to be very good evidence that women are interested in this sort of thing, and you must consider, too, that a very small percentage of the listeners ever take the trouble to write in for a piece of literature.

In its program of meat promotion, the Board recognizes the value of reaching the younger generation with information about this food product. With this thought in mind we have developed educational material and educational projects for high schools and colleges. Our text-book on meat, prepared in our home economics department, is in use in high schools and a number of colleges in every state of the Union. Likewise the food value charts about which I have already spoken, our meat chart booklets, and other printed material are in popular demand in educational institutions. The text-book is not given away to the high schools. They have to pay for it, and the fact that they do buy them in great numbers is evidence of their high opinion of the material contained in this publication.

In this field of endeavor the Board has developed contests of various sorts. We have meat judging contests for college students, and meat

identification contests for 4-H Club members and vocational students. The inter-collegiate meat judging contest at the International Livestock Exposition and also at the American Royal Livestock Show has come to be an outstanding event at those institutions. More than 15,000 high school boys and girls competed in the meat essay contest and the meat poster contest conducted by the Board last year. All of this activity is building a firmer foundation of meat knowledge for the future.

From time to time the Board is called upon by various branches of the industry to supervise special campaigns; campaigns that are financed by the branches seeking assistance. You may recall that last August an intensive campaign in the interests of beef was carried on. August was designated as "National Beef Month," and all sorts of promotional activities were carried on to stimulate the beef market. The result was very gratifying. There was a marked increase in the consumption of beef, and the market was materially improved.

Right at the present time we are in the midst of a special lamb campaign along these same lines. This campaign is sponsored by the Colorado-Nebraska Lamb Feeders' Association and the National Wool Growers' Association, with lamb interests throughout the country joining in carrying the project forward. A great many other interests are cooperating in making this effort a success. Chain store organizations, independent retail meat dealers, and independent grocers are directing special merchandising effort toward lamb. The colleges, the railroads, the marketing agencies, packers, journals of the livestock and meat industry, and many other interests are putting their shoulder to the wheel. With this coordination of effort, there is every reason to believe that the lamb campaign will be a success. The National Livestock and Meat Board is serving as the clearing house and is correlating the efforts of all of the various organizations.

Campaigns of this nature exemplify one of the major purposes for which the National Livestock and Meat Board was organized. It is simply carrying out its duty as a service organization for all branches of the livestock and meat industry.

I believe I said in the beginning that I would limit my remarks to highlights of the Board's work. I have carried on for quite a while already and perhaps some of you are beginning to think that I have forgotten that promise. But, when we consider that the most recent annual report of the Board summarizing the year's work was composed of 116 pages, I believe you will realize that, after all, I have not gone into a great deal of detail. I am not going to take time to go farther, and I hope that the story I have told here tonight will, in a measure at least, convey an idea of this big undertaking in behalf of the livestock and meat industry.

PRESIDENT STABLER: Thank you, Mr. Davis. I might say that I did not say anything about the Livestock Board before when I introduced

Mr. Davis, because, frankly, I did not know what it was. I am sure we all know what it is now and what it is trying to do. I was impressed, particularly struck, with what he said they were trying to do in teaching the retailers and the housewives to appreciate quality in meat. That will be very important to some of us who are trying to produce high-class market animals, and in the past have received very little more for them than for common animals. If that program of education is continued, I am sure we will all profit by it.

Another thing I was pleased with, and that is that they were trying to reach the younger generation. That is what we have been trying to do. I am sorry that we do not have more of the 4-H boys and girls here. Some of them meet with us regularly. I will ask the three W. R. Harveys, Senior, Junior, and Third, to stand up—there are three generations there. We would like more of the fathers and sons to attend our meetings.

Unless there is something further to come up we will adjourn. I would like to call on a good many here, but we have followed our program. I am sure I have enjoyed meeting you all. I hope to see you again next year.

Adjournment.

REPORT

OF THE

ANNUAL MEETING

OF THE

Maryland Tobacco Growers' Association

January 14, 1937

AT

Baltimore, Maryland

The annual meeting of the Maryland Tobacco Growers' Association, held in cooperation with the Maryland Farm Bureau Federation, was called on Thursday, January 14, 1937, at 9:30 A. M., at the Lord Baltimore Hotel.

Hon. Thomas Parran delivered the President's annual address, welcoming the members in attendance and congratulating them on the wonderful support given the Maryland Tobacco Growers' Association during 1936. "I am thoroughly convinced," said Mr. Parran, "that our farmers of Southern Maryland realize the importance of cooperation, this being evidenced by the most successful year's operation in the history of our Association."

Dr. F. B. Bomberger, President of the Baltimore Bank for Cooperatives, was the next speaker. A staunch supporter and ardent worker in the cause, Dr. Bomberger declared that cooperation among farmers is the most powerful agency yet devised to better the conditions of agriculture and rural life. "Many farmers," he said, "have a very mistaken notion about cooperation. They perhaps belong to a cooperative that markets their tobacco, or milk, or purchases their farm supplies on a cooperative basis. But they completely overlook the fact that through cooperation farmers may, if they desire, have the advantage of cooperative insurance, electric power, credit and a host of other things. The cooperative organization is, or ought to be, a part of the working machinery of the farm, just the same as a tractor, a harvester, or a truck."

Mr. George I. Gardiner, salesman, the next speaker, outlined the sales problems in handling the 1935 crop. "Regardless of anything that was said or done by the outside selling agencies," said Mr. Gardiner, "bear this in mind: We know and can prove that your Association and your Association alone was the controlling factor in main-

taining the fair price received by the farmers for their crops. You have no idea of the work necessary to protect your interests and I promise you that we can better this price if all the farmers of Southern Maryland will give us their 100% support."

Mr. George Sachse, Manager of the Maryland Tobacco Growers' Association, read the financial report for the year, which report reflected an increase in receipts of tobacco and sales of fertilizer, feed and seed. "Your organization," said Mr. Sachse, "is in the best financial condition since its organization and I sincerely hope that with your cooperation during the coming year I may be able to further strengthen our Association, which will revert to the general welfare of our members."

ANNUAL WINTER MEETING

OF THE

Maryland State Poultry Council

January 12, 13, 14, 1937
Lord Baltimore Hotel
Baltimore, Maryland

STATE POULTRY COUNCIL MEETINGS

PARLOR G—LORD BALTIMORE HOTEL

JANUARY 12, 1937—8:00 P. M.

Conference of Directors, Delegates and Committee Chairmen

Present—H. D. Copeland, John J. Cowan, Dr. M. A. Jull, F. B. Bolton, Neal A. Truslow, John W. Evering, Chas. F. Hines, J. A. Fuchs, A. R. Peterson, Ivon T. Morton, Mrs. Algernon Carter, Mrs. W. W. Hopkins, W. H. Rice, Louis Ganssle, H. L. Altenburg, I. L. Langeluttig, S. H. DeVault, Ralph B. Nestler.

President Copeland presiding.

Committee projects were discussed and chairmen made brief progress reports as follows:

1. Breed Improvement—Dr. M. A. Jull pointed out the need of breed improvement in egg production as the outstanding need in Maryland due to the fact that eggs are the principal source of income to Maryland poultrymen.

An egg laying and breeding contest at College Park was proposed as a means of leading the way to such improvement and was discussed by several present.

2. Education and Research Committee. Prof. Geo. D. Quigley reported that the project selected was the relation of yolk color to food value of eggs, and a vitamin A study was now about to be inaugurated.

3. Economic Stabilization—Dr. S. H. DeVault reported on the progress in economic poultry studies by the Department of Agricultural Economics at the University of Maryland and referred to studies of commercial poultry farms and commercial broiler farms by his department and A. A. A., and surplus and deficient areas of egg production in the state with county agents and specialists showing marketing channels, etc., which is now in progress.

4. Marketing—Chairman Copeland referred to the work in Massachusetts, New Jersey and other states in reference to returns to producers as to marketing eggs, turkeys, etc., through cooperative action. The apathy of Maryland producers towards marketing problems and cooperative effort has been most discouraging to the committee's efforts.

   Cooperative action of producers is sorely needed and will probably be secured only through intensive educational efforts.

Adjourned—9:00 P. M.

WEDNESDAY, JANUARY 13, 1937

PARLOR B—LORD BALTIMORE HOTEL

Meeting convened 10:15 A. M. President H. D. Copeland presiding.

Highlights From The Talk On "EGG MARKETING OPPORTUNITIES MARYLAND POULTRYMEN ARE OVERLOOKING"

Given by JAMES M. GWIN

(Graphs and pictures used in connection with the talk make it difficult to give a written statement exactly as presented.)

Maryland poultrymen, by virtue of their location in the east, must operate under comparatively high land, labor and feed costs. The success of their enterprise under these conditions must depend upon the sale of full, firm-quality eggs which make up the only grade that the eastern poultryman can produce successfully in competition with producers of other sections of the country.

The production advantage held by the western poultryman which enables him to place low to average quality eggs on the Baltimore market at a lower price than eggs can be produced in Maryland, clearly illustrates the reason why local producers should concentrate on the production of quality eggs and the utilization of every advantage their eastern location affords.

One of the important natural advantages offered Maryland poultrymen is their geographic location in the midst of an area that consumes more eggs than it produces. This affords the industry an opportunity to concentrate sales efforts primarily on local consumption and develop people's natural desire for fresh eggs produced within the state.

The enactment of the Maryland fresh egg law is one of the most constructive steps ever taken by this state to develop its industry along a quality basis. When your enforcement agency is enabled through sufficient financial support to rigidly enforce this act, there will be a marked change in quality merchandising. Egg interests all along the line will be willing to recognize and pay for the quality that many thousands of Maryland poultrymen are willing to go to the extra effort to produce, if additional reward is offered for the effort.

Unfortunately some Maryland producers fail to utilize this "nearness to market" advantage and allow their fine eggs through improper handling to deteriorate in a comparatively short time to such an extent that they arrive on Maryland and other nearby markets far below the quality standards of eggs produced twenty-five hundred miles away and about equal to the quality of eggs produced in the middle-west where feed and labor costs are much lower.

Baltimore should be the best market for Maryland eggs. If it is not at present it should be developed. Other markets in addition to the smaller cities in Maryland that have a price influence on Maryland eggs include New York City, Washington and Philadelphia.

In general, Maryland eggs are considered a quality pack on the New York market during all but the very warm months of the year. Additional effort on the part of producers and producers' organizations could lift Maryland's reputation to the point attained by other states during the past three years.

Following Mr. Gwin's presentation, a discussion of a program to prevent poultry thieving was discussed, involving the enactment of a poultry transportation law. President Copeland, Mr. Jas W. Stevens of the Baltimore Butter and Egg Exchange; Mrs. A. W. Sattler, Monkton, Md.; Mr. H. H. Rieck, Preston, Md.; Mr. J. W. Evering, Stemmers Run, Md., and others participated.

Meeting adjourned at 12:30 P. M.

STATE POULTRY COUNCIL DINNER MEETING

6:45 P. M.—PARLORS E AND F

LORD BALTIMORE HOTEL

President H. D. Copeland introduced Dr. M. A. Jull, Head of Poultry Department, University of Maryland, and requested Dr. Jull to preside.

Dr. Jull spoke on the needs for a Poultry Department at the University of Maryland.

POULTRY RESEARCH AND EXTENSION PROGRAM FOR MARYLAND

By MORLEY A. JULL

Head of Poultry Department

University of Maryland

Fundamentally, progress in poultry production depends upon the results of research. This same principle applies in the various industries as well as in other branches of agriculture. The paramount need of the Maryland poultry industry is a well-developed poultry research plant at the University of Maryland, a well organized research program, well balanced courses of instruction, and an adequate extension program to carry the results of research to the producers.

In order to determine the more apparent needs of the industry from the standpoint of future research work, the poultry staff of the University have estimated the annual losses suffered by the producers in Maryland's second most important agricultural industry. The

following items of losses could be reduced very materially if the University was better equipped to provide producers with the practical information which they so urgently need in order to make poultry production and marketing more profitable, and to improve conditions in the industry. The estimated losses are annual losses.

1. Losses in depreciated value of market eggs	$ 420,000.00
2. Losses due to low hatchability of eggs incubated	125,000.00
3. Losses due to chicken mortality to 12 weeks	214,200.00
4. Losses due to growing and laying stock mortality	731,800.00
5. Losses due to low hatchability of turkey eggs	57,500.00
6. Losses due to turkey mortality	146,800.00
7. Losses due to depreciated value of market poultry	525,000.00
Total annual losses	$2,220,300.00

In addition to these actual losses which the industry sustains, there should also be taken into consideration the many thousands of dollars sent outside of the State every year for hatching eggs, baby chicks, and breeding stock, all of which should be produced in Maryland. Considerable quantities of market eggs and dressed poultry are also secured from other States, but these "importations" are offset to a considerable extent by the market eggs and poultry shipped from Maryland to outside markets. Another great economic handicap in the poultry industry arises from the shipping of live poultry to consuming centers, involving as it does paying freight and express on heads and feet and offal and the costs of shipping coops. If most or all poultry could be shipped dressed instead of alive, many thousands of dollars would be saved every year.

These staggering losses are for the most part avoidable, and if research work conducted by the University would lessen the losses that producers suffer by as much as 25 per cent, it would mean a saving of over $550,000 to Maryland poultry producers annually. Over a ten-year period this would mean a saving of over $5,500,000. A well equipped research plant on a modest scale would constitute the best kind of an investment which the University could make on behalf of the industry.

Problems to be Studied at the Research Plant

During the past few months many poultrymen and poultrywomen in all parts of Maryland have been asked to suggest what in their opinion are some of the most important problems facing the industry. The replies received were very interesting and show that the poultry raisers in general are very much alive to their problems and are anxious to have a considerable amount of experimental work undertaken, the results of which should point the way to better profits in poultry production.

The following are among a few of the most important problems

which poultry raisers have suggested be undertaken when the new poultry research plant at the University is completed:

1. Better balanced rations with protein supplements to produce eggs at less cost.
2. The best sources and proper amounts of vitamins and minerals to maintain good egg production.
3. Better growing rations for turkeys, special attention being paid to the protein requirements of turkeys.
4. More efficient growing rations for broilers to promote not only better growth but better feathering.
5. Diets for the breeding stock to produce the highest possible hatching quality of the eggs produced.
6. Brooding and management methods to reduce mortality among broilers and turkeys.
7. The best methods of fattening poultry for market.
8. Housing and management methods to reduce disease and mortality among laying pullets.
9. Disease in chickens and turkeys as the result of vitamin A and D deficiencies in the ration.
10. How to develop by breeding and selection methods high laying strains combining early sexual maturity, high rate of laying, non-broodiness, and persistency of production.
11. How to maintain good egg size with good egg production.
12. How to increase hatchability by proper breeding methods.
13. Breeding and selection methods to develop the most efficient meat-producing type of turkey.
14. Improving the hatchability of turkey eggs by feeding improved diets and by the proper selection of breeding stock.
15. The best type of houses for laying stock.
16. Factors affecting the quality of live and dressed poultry, including broilers, fryers, roasters and turkeys.
17. Factors of production affecting the quality of market eggs, including the color of yolk and the condition of albumen.
18. How to lessen the deterioration of market eggs from the time they are produced until they are purchased by consumers.
19. The effects of marketing and storage methods on the flavor of eggs.
20. The grading of eggs and live and dressed poultry as affected by diet and management methods.
21. The best methods of reducing the costs in marketing poultry and poultry products.

It is also proposed to study the best methods in the production of ducks, geese, guineas and pigeons.

Immediate Needs of the University Poultry Department

In order to carry out the work involved in all of the above problems which have been proposed by the poultry raisers of Maryland, a new and enlarged poultry plant is necessary. The land on which the old poultry research plant has been located for many years has recently been taken over by the Bureau of Mines. A new tract of land, therefore, becomes necessary and it is proposed to secure a tract of approximately 50 acres to provide sufficient area for the necessary brooding, breeding and laying houses for chickens and brooding and rearing houses for turkeys, ducks, geese and guineas, and a properly equipped pigeon house.

Leaders of the poultry industry have requested that the egg-laying contest be reestablished at the University. It is proposed, therefore, to establish an egg-laying and breeding contest where the breeding stock will be progeny tested with a view toward developing superior laying strains.

There will be a feed storage and supply house each for chickens and for turkeys. A considerable amount of fencing will be necessary as well as water piping, electric current lines, main and service roads.

A poultry building is required for the purpose of providing offices and laboratories for the research, teaching and extension personnel, the necessary classrooms for various classes of students, and rooms for incubation work, the grading of eggs, the fattening and dressing of poultry, and for conducting experiments on the nutritional requirements of chicks and laying hens in batteries as well as for carrying on work on the various physiological factors affecting the quality of eggs and poultry meat. Cold storage rooms for eggs and dressed poultry are also to be provided. A certain amount of equipment will be necessary, including classroom seats, desks, filing cabinets, laboratory benches and tables, and batteries for chickes, laying hens, and fattening stock for conducting much needed experimental work on feeding and factors affecting the quality of eggs and poultry meat.

More Extension Work Needed

The results of research work obtained at the new poultry plant should be of great value to the poultry extension specialists in carrying information of practical value to producers in all parts of the State. Additional help for the specialists would enable them to render more effective service to producers in four of the most needed lines of work. These four lines of work include: (1) building up the bred-to-lay quality of our farm and commercial flocks; (2) reducing mortality in chicks, laying flocks and turkeys through better methods of management; (3) improving its quality of broilers, roasters, and turkeys through better methods of breeding, feeding, and management; (4) lending every encouragement to producers in solving their egg and poultry marketing problems.

Dr. Jull then called upon Dr. T. B. Symons for observations in connection with this subject.

REMARKS BY DR. T. B. SYMONS

Director of Extension Service

MR. TOASTMASTER AND MEMBERS OF THE STATE POULTRY COUNCIL:

I am very happy to be present at this first annual banquet of the poultrymen in connection with our Farm Bureau Meetings. I think it is very fine that your Council decided to reunite with our general farmers' organization and thus cooperate in mobilizing all of our forces in the promotion of cooperative endeavor in agriculture.

I want to particularly congratulate the Council on the fine Egg and Chick Show now on exhibition in this hotel. The quality is A-1, and I am sure it reflects great credit upon the poultrymen of the State.

Let me emphasize three S's—"Standardization"—"Stability" and "Satisfaction."

You have heard the interesting program for the development of our poultry work at the Institution as given by Dr. Jull. I have great confidence in his ability in association with our other workers in this field, Mr. Rice, Mr. Raper, Mr. Shaw, Dr. Welsh and others who will be happy to cooperate in carrying out the fine program for the development of the Institution as now projected by President Byrd.

If we can drive home to our people the importance of proper standardization of products we will insure greater stability, which will bring lasting satisfaction to the fine group that we have engaged in the poultry industry in Maryland.

I should like to discuss the general question of crop estimates as revealed through our experience this Fall in connection with the volume of turkeys and broilers available for market. My feeling is that the subject deserves earnest consideration so that our Government and State reports may not serve as a wet blanket or produce a bearish market. I believe in giving the people, including the consumers, all of the facts in connection with any product, but I believe that discretion should be employed as to the time when these estimates should be publicized. I trust that we may be able to have a conference with Federal officials, as well as discuss among our own people, future procedure in this field that will be more satisfactory and fair to our producers.

I am delighted with the splendid progress that has been made in the poultry field during the past twelve months. Let us hope that we will be successful in the coming Legislature in securing more adequate funds for building up our poultry plant and further development of the industry in the State.

Dr. H. C. Byrd, President of the University of Maryland, was then introduced by Dr. Jull.

DEVELOPING AN ALL-ROUND POULTRY DEPARTMENT TO SERVE THE POULTRY INDUSTRY

By DR. H. C. BYRD

President of the University of Maryland

I am very glad, indeed, to have the pleasure of being with you to discuss ways and means to improve the poultry situation in Maryland. You will be interested to know that the University is developing plans with a view toward a great enlargement of the services now being rendered. In Agriculture, we have recently added a number of new staff members, and are reorganizing the work generally so that this end may be achieved, especially in the research and extension fields. Since the poultry industry is our second most important agricultural enterprise, we are very anxious to do whatever can be done at the University to strengthen the research, extension and regulatory work. You will be glad to know that we have recently secured the services of Dr. L. H. James as Head of the Bacteriology Department. He comes to us as an outstanding bacteriologist, and since he has already done a considerable amount of research on factors affecting egg quality, we hope that the bacteriology and poultry departments will be able to undertake cooperative projects in egg quality studies. The results of these investigations should be of considerable value to poultry producers.

It is very interesting to note that the poultry industry has advanced most in those states where the State College of Agriculture has developed a strong research, administrative, extension, and regulatory program. In Maryland we have the advantage of having the State Board of Agriculture with its various regulatory activities as an integral part of the College. This provides for the closest possible cooperation between extension and research work on one hand, and such regulatory activities as egg and poultry grading work on the other hand. The Live Stock Sanitary Service is in a position to cooperate with the poultry department in such poultry disease problems as the control of pullorum disease, which, unfortunately, causes great loss to our poultry raisers. At College Park we hope to develop an all-round poultry department where research work will be undertaken to solve the numerous problems of production, disease control and marketing which face the poultry raisers of our State. This work will be under the direction of the head of the poultry department, and it is anticipated that we shall soon have a new, up-to-date poultry plant to replace the old one, in order to have facilities for a comprehensive program.

Just a few illustrations may be given to show the importance of developing research work on behalf of the poultry industry, and to emphasize the fact that it is in those states where a good research

program has been developed that the poultry industry has had greatest success. I need only call your attention to the very constructive breeding work undertaken at the Massachusetts Agricultural College, and the leadership which Massachusetts poultry breeders have taken in egg laying contests, and in the average egg production of their farm and commercial flocks. Then, again I might call to your attention the poultry disease control work carried on at the New Jersey Agricultural Experiment Station, the outstanding feeding research carried on at State College in Pennsylvania, and the incubation and egg quality studies that are carried on at Cornell University in New York State. These various lines of work have been of inestimable value to the poultry industry of their respective states, and we are anxious to do as good, or even better, work in Maryland.

As I understand the situation, some of our most important problems awaiting solution in Maryland include the four following major lines of effort. First, a breeding project of some kind should be undertaken so that our poultrymen will be able to secure a higher average egg production per bird in order to produce eggs more efficiently. Second, studies should be undertaken with a view toward improving the quality of broilers and turkeys sold, as well as in the improvement of the quality of eggs produced in hot weather. Third, if poultry raisers are to realize the greatest possible profits from their efforts, steps must be taken to reduce mortality in the growing chicks, laying pullets and turkeys. Fourth, we must develop better methods of marketing our eggs, especially in the surplus producing section of our State.

Finally, I want you to know that I intend that the University of Maryland shall be of the greatest possible service to the poultry industry, and hope to merit, and therefore, expect, the fullest possible cooperation of the poultry interests. We are working for you. Command us in everything and in every way in which you feel you need our help.

Following Dr. Byrd's presentation, Mr. H. A. Bittenbender of the Buckeye Incubator Company was introduced by Dr. Jull.

VALUE OF POULTRY IMPROVEMENT PROGRAM TO THE POULTRY INDUSTRY

By H. A. BITTENBENDER

The question is often asked, does research pay? The answer to this question is without any doubt positively "yes." The poultry industry at the present time is still in its infancy. It is still burdened with growing pains. There are many unsolved problems. There are many questions asked daily of poultry authorities to which there are no answers. There is still confusion in the minds of

breeders, hatcherymen and commercial poultrymen, as to what is the best and correct procedure to follow. It is the duty of State and Federal Institutions to carry on research and investigational work that will help the hatcheryman, the breeder and the commercial poultryman, solve these problems. Without organization, this is impossible, but of necessity equipment must be provided and facilities made possible to solve these problems and establish a sound and well rounded poultry program. Suitable appropriations should be made to provide answers for these problems.

Our Federal and State authorities need the viewpoint of the practical poultryman, the breeder and hatcheryman. It is equally important to have a suitable organization through which to disseminate the results of research work.

There are so many unsolved problems that I even hesitate to name or even suggest the problems—for fear of leaving out what may be tomorrow even a more important factor. However, a few of the general things that may be done that will show immediate results, I am going to discuss briefly.

Without doubt livability, rate of growth, productiveness—or in other words, health, vigor, vitality and constitution, and resistance to disease, are factors that are most essential, if the hatcheryman is to realize a profit, if the breeder is to succeed, or if the commercial poultryman is to obtain profit on his investment. These factors are not results of accidents. They are inherited characteristics. They are obtained through careful management and proper breeding methods. I believe some sort of a program that will insure the proper distribution of this class of stock, either through baby chicks, hatching eggs, breeding stock, or progeny tested cockerels, is a program well worthy of consideration.

During the past ten years the number of hatcheries and the production of baby chicks has grown by leaps and bounds. Each year there are more chicks produced in breeder and commercial hatcheries, than the preceding year. With this growth of the baby chick industry has also come an improvement in the breeding flocks. The question is, has the breeder kept pace with the hatcheryman? Too much emphasis cannot be placed upon the quality of breeding stock and upon the value of a good hatching egg. No matter how well the egg is incubated it cannot improve upon the characters that are transmitted from the parent stock through the egg to the baby chicks. In other words, it is most important to give to the incubator—the proper kind of an egg. Then, the problem of handling that egg to produce the right kind of a chick, becomes one of management only. Correct incubation is necessary and extremely vital. However, the incubator operator cannot improve upon the quality of the egg—that must be left to the breeder.

Pullorum disease can be controlled with a well organized blood testing program. I believe that the quality of baby chicks produced will be greatly improved if the right kind of a properly supervised blood testing program is established. It is not right to expect poultry breeders, hatcherymen and commercial poultrymen to conduct their own research. I believe the responsibility is a considerable one between the poultry breeder and hatcheryman, the commercial poultryman and State and Federal authorities.

Following Mr. Bittenbender's presentation, Mr. W. D. Termohlen of the U. S. Department of Agriculture, Agricultural Adjustment Administration, Washington, D. C., gave the following address.

BETTER PRICES FOR MARYLAND POULTRY PRODUCTS

By W. D. TERMOHLEN

Agricultural Adjustment Administration, U. S. D. A.
Washington, D. C.

One may take several viewpoints when reading the subject assigned. Some folks may expect the speaker to tell them that better prices may be visioned on the horizon for the immediate future. However, when one considers production and market statistics relating to eggs and poultry, the hard, cold facts indicated dampen any over-enthusiasm as to the immediate future. Since I am not necessarily bound to discuss the outlook, I want to weave my discussion around the longer-time viewpoint.

It is my opinion that during the next five to ten years we shall see considerable adjustment in the production of poultry products. I base this personal opinion on the fact that there must be further adjustment in agricultural production if the farmer is to have his just share of the National income and is to enjoy a proper standing of living. This calls for changes in agricultural production and marketing methods.

You are all undoubtedly familiar with the activities for agriculture in the past few years and I believe are cognizant of the fact that there is still much to do on the farmers' problems. These programs and the adjustments which are accompanying them call for a watchman at the crossings, so to speak; they call for attention to factors which will enable the producers of the poultry industry to meet the competition of other agricultural enterprises. Among these factors I can think of at least two which are extremely important; namely, the cost of production and quality of the products.

Husbandry methods and marketing methods must be carefully considered during the competitive period ahead. Poultry is raised throughout the United States and it might well be said that every

State is in competition with other States. Each State has a definite place in the poultry picture. Some States, because of the very large poultry population in comparison to the human population, are constantly surplus-production States. Other States are surplus-production States part of the year and deficit areas the other seasons. Other States must continuously have shipped in poultry products, since they do not produce a sufficient amount for their own population, and in all probability very logically should never plan to produce a sufficient amount for their own needs. Therefore, we need extremely careful consideration to our husbandry and economic problems.

During the period ahead it would seem to me that the poultry industry in any and every State needs a navigator to chart the course and a crew to carry out the commands. I would say that the navigator in your State in respect to the poultry industry could well be the Maryland State Poultry Council and the crew, the loyal and interested members of the industry cooperating together. A navigator needs technical assistance, and for technical advice you have a most excellent personnel and here I refer to none other than Dr. M. A. Jull, Chief of the Poultry Work at University of Maryland, and the technical men whom he has on his staff.

If your poultry department at the State University has a proper number of technical assistants, facilities to carry out a comprehensive research program to obtain facts regarding production, quality, and technical market information on the problems now facing the producers, and also looking ahead in an effort to ferret out possible future problems, then I believe that one could say that in this period ahead better prices for Maryland poultry producers may be possible.

A strong Poultry Department, or Poultry Bureau as I believe some of your folks desire to call it, in your State and an active State Poultry Council cooperating with the Department at the University are indicative of a bright future. Without them I would fear that in the stream of forward-moving poultry industry traffic that you would find yourself lagging way behind or ditched by the side of the road watching the rest go by until they had disappeared from sight.

Production and marketing go hand in hand. In both are factors which make for better or poorer prices and they are never disassociated. The production phase has been discussed so let me briefly enumerate some of the phases connected with price-making factors on which your State University can assist during the period ahead:

1. Quality. With improvements in quality in various areas of the country this problem is becoming more and more important and the producers in your State need to have information on such points as follows:

   a. Factors of production such as breeding and feeding which affect the quality of eggs and poultry meat. For example, what

causes watery whites; what affects egg yolk color; what affects shell strength; what factors influence flavor in eggs; what are the factors affecting fleshing, early maturity, proper feathering, and flavor in meat in poultry?

b. Methods of caring for and handling on the farm which will preserve and maintain the quality of the poultry products produced.

c. The effect of geographic and climatic conditions on the quality of poultry products, such as type of water, types of soil, humidity, and seasonal changes in temperature and precipitation.

d. Factors that determine the measures of quality in eggs and poultry. What are the qualities now being produced and economic methods of improvement for both eggs and poultry meat quality?

e. What quality deterioration takes place in market channels in both eggs and poultry, and what measures can be introduced to bring about improvements?

f. What is the best market type of eggs, broilers, fryers, roasters, and turkeys for Maryland producers to produce in relation to their production and market situation?

2. Market demands.

a. How can the home market demand be improved? This involves a study of present demands as a basis of seeking out potential markets and obtaining leads which may point out the means of securing better prices.

b. How can demand in markets in other States for Maryland poultry products be improved?

c. Are your producers now utilizing the best market or markets?

3. Market technique and method.

a. What is the best candling device for measuring egg quality?

b. Should more of your poultry be sold dressed?

c. What are your present market facilities; are they being used to the best advantage; should changes be made in these facilities to obtain lower costs and better prices?

These are but a few of the important problems. The time is too limited for anything like a complete discussion. We could divide each of these problems already mentioned into sub-problems. Also, work on these problems will call to attention additional channels which call for research. Work on such problems as listed above require personnel trained in such subjects as chemistry, genetics, physiology, physics, biology, economics, etc. It requires proper laboratory facilities and equipment, poultry stock, and operating funds.

The keen and prosperous business man is constantly studying his production and sales problems and many commercial concerns have research departments so that they may be enabled to keep abreast of the times and ahead of the average. Poultrymen are business people (at least they should be) and consequently, should act as other people in business do. The University can serve as the commercial research department and those poultrymen who utilize the information developed by the research department and disseminated by the Extension Service will be in a position to get better prices and more benefits from their enterprise.

Increased competition calls also for trained personnel in the industry itself. Again your University can serve you by holding short courses on such subjects as feeding, breeding, marketing, etc. This affords an opportunity for the person now in the poultry business to keep informed as to new developments. Every possible effort should be made to encourage students to attend the University and obtain a degree, and it will surprise you the improvement that will result in the industry as some of these graduates go back and take their place on farms throughout the State.

Your University has a very ideal location to also provide facilities in the way of graduate courses for those persons interested in obtaining advanced degrees. You are close to Washington and Beltsville with the trained Government personnel and marvelous library facilities which, by the way, are a very important item to one pursuing research work. As a Government employee I find an increasing interest among my fellow workers to improve their knowledge and it is possible that many of these people would attend your University to take graduate courses if proper arrangements could be made so that they might take such work without direct interference with their daily endeavors.

Facts and knowledge are powerful tools in the hands of man when properly used to bring about improvement and can be a firm foundation to bring about better prices for Maryland poultry products.

Following Mr. Termohlen's presentation several producers, including Mr. H. D. Copeland, Mrs. W. W. Hopkins, Mr. Jno. E Clark, and Mr. H. H. Rieck, were introduced and made brief contributions.

Mrs. W. W. Hopkins' contribution is presented herewith.

REMARKS BY MRS. W. W. HOPKINS

MR. CHAIRMAN AND FELLOW POULTRYMEN AND WOMEN OF MARYLAND:

It has been my pleasure to attend these meetings for several years, and always the same subject comes up: the lack of poultry activities in Maryland.

Each year, after one of these get-together meetings, we go back

home fully resolved to do something about the situation, but under the stress of our daily routine of work, our resolutions fade, until something occurs which brings forcibly to our minds our shortcomings and the lack of proper equipment for Research and Instruction in efficient Poultry Husbandry in our State.

Time has moved on and as we assemble at this meeting, we are pleased and happy to state that there has been secured for the Poultry Industry of Maryland, a man of rare ability, to head the Poultry Department at the University, and under the wise and judicious leadership of Dr. Morley A. Jull, with the full and earnest cooperation of the poultry folks, the Industry in Maryland is going places; provided, that Dr. Jull and his associates can have the proper equipment that is needed and required. You can secure the most efficient mechanic in the whole world, but unless he has the proper tools and equipment to carry on the work, then all is in vain, for he has nothing with which to build. The folks who represent the Poultry Industry of Maryland, believing that this department should receive the same consideration and recognition as other Agricultural interests of the State are now receiving, have become aroused to the condition as now exists, and with the leadership of such men as Dr. Byrd, Dr. Jull, Dr. Patterson, Dr. Welsh, Dr. Symons and their associates, plans have been developed and are being perfected, and, when materialized, will quite adequately take care of the problem for many years to come.

Mr. Chairman, I think the Poultry folks of our State are becoming more poultry conscious; they are waking to the fact that a *"hen"* is something more than a mere barnyard fowl to be shooed out of the barn door, where she goes to find something to eat before going to roost on the binder in the machine shed, or some convenient tree, that she is a producer in her line, the same as any other branch of live stock, and should and is taking her place, and markedly so, in the agricultural activities of the State.

With an average annual income from poultry and poultry products amounting to $12,000,000, and a loss of $2,220,300 annually;

With the poultrymen who desire to enter their layers in contest pens having to go to other States;

When a breeder, desiring pullorum clean stock for his pens, having to do likewise;

When thousands of dollars are going out of the State, yearly, in order to secure the quality of baby chicks that are desired;

When turkey producers have to apply to out-of-State sources in order to secure a formula with which to feed their breeders to keep them in A-1 conditions before laying season;

When the cry goes out each year—What can we do about the *crooked breastbone* in turkeys, which so greatly reduces the income from sales, and I could go on and on:

It would seem that it is time we became awake to the situation as now exists and get on the job, and do our part in helping to put across the program of the *Proposed Poultry Research Laboratory and Office Building for the Poultry Department at the University of Maryland.*

First, we should see to it that every representative from each of the twenty-three counties and Baltimore City, if possible, receives such information which I hold in my hand and which, no doubt, you have all seen, and all other data, which is available; they should be personally contacted and in so far as lies in our power, tell them the story of what we are striving to do for this neglected industry, and folks, we have no time to lose, but must get on the job and stay there until we accomplish our end.

The University folks are prepared to do their part and will go the whole way with us—Are we going to do our part? I hope so.

I know of no income from the farm which covers so wide a spread, as the revenue derived from poultry. The weekly income from egg sales is more than welcome to the homemaker, and it is through this same revenue that the standard of living on the farm has and is being maintained.

Let us make a New Year resolution that—

"United by the strong and faithful tie of Agriculture we mutually resolve to labor for the good of our State, County and mankind."

Let us strive to make 1937 a banner year, especially in the poultry industry, folks. We just cannot afford to let our industry down; we have a message to carry and a duty to perform.

Let us stand back of the University program whole-heartedly, and give our earnest cooperation and support. Will we do it? I believe we will.

Meeting adjourned at 10:45 P. M.

ANNUAL BUSINESS MEETING

THURSDAY, JANUARY 14, 1937—9:45 A. M.

PARLOR E—LORD BALTIMORE HOTEL

President H. D. Copeland presiding.

The following Standing Committee Chairmen made informal progress reports for their respective committees:

Marketing—Mr. H. D. Copeland.

Organization—Mr. H. H. Rieck.

No reports were available from the Legislative, Feeding and Nutrition, Disease Control, and Finance committees, due to illness and absence of Chairmen of these committees.

The report of the Breed Improvement Committee was presented on Wednesday evening by the chairman, Dr. M. A. Jull.

Reports of the Economic Stabilization, Education and Research, and Publicity Committees follow:

REPORT OF THE ECONOMIC STABILIZATION COMMITTEE

By S. H. DEVAULT

Chairman

During the year just passed, two economic studies were completed, namely "An Economic Study of the Broiler Industry in Maryland" and "An Economic Study of Poultry Farms in Maryland." Some progress was made in the completion of the study of the "Production, Consumption, Exports and Imports of Eggs in Maryland by Local Areas," which was inaugurated in 1935.

An Economic Study of the Broiler Industry

Maryland Experiment Station Bulletin, Number 390, published in January, 1936, presents the results of an economic study made of 109 farms specializing in broiler production for the year ended June 30, 1935. The purpose of this study was as follows: To secure data on the cost of raising and marketing broilers; to determine the relative profitableness of broiler production and the factors affecting profits; and to secure data on feeding practices, brooding practices, losses from disease, principal causes of losses, marketing practices and methods of sale. Some of the significant findings are as follows:

The average number of broilers raised per farm was 8,231; investment per farm averaged $1,393; income, $4,065; and cost, including unpaid family labor, $3,942. Income per farm averaged 49.4 cents per bird; cost, 47.9 cents per bird; and net profit, 1.5 cents per bird. The returns per bird ranged from a net loss of 81 cents to a net profit

of 33 cents. Of the farms surveyed, 53.2 per cent made a net profit while 46.8 per cent sustained a loss. Feed costs constituted 53.5 per cent of the total cost of production and marketing; cost of chicks, 22.4 per cent; labor, 7.7 per cent; marketing costs, 5.7 per cent; overhead costs, 5.5 per cent; and general expenses, 5.2 per cent.

The most profitable farms returned a larger income per bird at a lower cost than the least profitable farms. Gross income averaged 57.2 cents per bird on the most profitable farms and 44.7 cents per bird on the least profitable farms, while costs averaged 44.7 cents and 52.8 cents per bird for the two groups respectively. (The most profitable size of enterprise was from 5,000 to 15,000 birds per year.) Feed, labor, and fuel costs per bird increased as the number of birds per farm decreased. Profits decreased as the percentage of mortality increased.

The most profitable weight for marketing was from 2.75 pounds to 3 pounds per bird. The most profitable method of marketing was to local buyers and truckers, and the most profitable months to market broilers were April, May, July and December.

Profits were influenced by the following factors: (1) Gross income and cost; (2) efficiency in the use of feed; (3) efficiency in the use of labor; (4) marketing cost; (5) efficiency in the use of fuel; (6) cost of chicks; (7) capital investment; (8) size of the enterprise; (9) weight of birds at time of sale; (10) mortality; (11) feeding practices; and (12) marketing practices.

The report offers some recommendations in regard to the more profitable production and marketing of broilers.

An Economic Study of Maryland Poultry Farms

The results of this study were published in Maryland Agricultural Experiment Station Bulletin, Number 397, in July, 1936. (The results of this study are for the years 1931, 1932 and 1933.) The purpose of the study was to establish facts concerning the organization, management and profitableness of poultry farming in the State and to determine the causes of variation in profitableness.

The following are the significant data on a per farm basis: Number of layers, 781; eggs per hen, 127; investment per farm, $8,829; farm receipts, $3,524; farm expenses, $2,353; farm income, $1,171; interest on investment, $443; labor income, $728; cost of producing a dozen of eggs, 20.1 cents; and average selling price per dozen, 21.9 cents.

The farms were grouped according to labor income showing the 25 per cent most profitable farms, and the 25 per cent least profitable farms. The most profitable farms had an average farm income of $3,474 and an average labor income of $2,900 per farm. The average income on the least profitable farms was —$165 and the average labor

income was —$648. The most profitable farms obtained more than three and one-half times greater farm receipts per farm than the least profitable farms; kept practically twice as many layers, producing nearly three times as many eggs; produced 43 more eggs per hen; had egg sales of $1.14 more per bird; had a labor expense of $23.88 less per $100 of receipts; sold $1.22 more of eggs and poultry per $1.00 of feed costs; and received nearly 4 cents more per dozen of eggs sold.

Where the egg production per hen averaged 140 eggs and over, the labor income per farm averaged $1,431. The labor income decreased constantly with a decrease in the number of eggs produced per bird, and averaged a minus $278 on farms where the production per hen was 79 eggs or less.

The farms with egg sales per layer of $2.75 and over made a labor income of $1,695, whereas, farms with egg sales of $1.74 or less per layer made no labor income.

The price received for eggs on the most profitable farms averaged 25.4 cents per dozen, as compared with 21.7 cents per dozen on the least profitable farms. The average price received per dozen was higher on the farms with the larger number of layers. This is probably due to the fact that larger flocks warrant specialization, care and good management. Poultrymen with large flocks are more conscious of the importance of efficient marketing.

Other factors which influenced profits were efficiency in the use of feed and labor. On the most profitable farms, egg and poultry sales averaged $2.62 per $1.00 of feed used, while on the least profitable farms, egg and poultry sales averaged only $1.40 per $1.00 of feed. Likewise, on the most profitable farms labor expense per $100 of receipts averaged only $13.34, as compared with a labor expense of $37.22 per $100 of receipts on the least profitable farms.

Production and Consumption of Eggs in Maryland, by Local Areas

On July 1, 1936, Mr. Alfred B. Raby, a graduate of the North Carolina College of Agriculture and Engineering, was employed by the Maryland Agricultural Experiment Station to make a study of some basic factors pertinent to the establishment, organization and operation of production point co-operative egg auctions in Maryland. The study covers the seasonal production of eggs in the principal producing areas in the State, the seasonal marketing of eggs, methods of sale, principal markets on which the eggs were sold, methods of transportation, marketing costs, prices received and general information in regard to local production, consumption and purchase of eggs. The study is not yet completed. Some of the preliminary information in regard to the local production and consumption of eggs is presented herewith.

The study was confined to two areas, namely, Baltimore, Harford, Carroll and Frederick counties in the Piedmont Plateau region, and Wicomico, Worcester, Somerset and Caroline counties in the Lower

Eastern Shore. In the Lower Eastern Shore region, the surplus of eggs produced in the four counties, above the quantity consumed in the counties, was 5,287,469 dozens for the year 1935. The surpluses for the different counties were as follows: Wicomico, 1,186,790 dozens; Worcester, 1,775,986 dozens; Somerset, 1,060,363 dozens; and Caroline, 1,264,330 dozens. In the four counties surveyed in the Western Shore region, the surplus of eggs above consumptive requirements in the counties was 6,542,173 dozens, distributed as follows: Baltimore County, 1,626,637 dozens; Harford County, 984,473 dozens; Carroll County, 2,714,229 dozens; and Frederick County, 1,216,834 dozens. These two regions represent the largest producing areas in Maryland and the quantity available for sale constitutes a large percentage of the total surplus eggs produced in Maryland.

The non-local eggs consumed in the four counties on the Eastern Shore is 248,466 dozens, which is equivalent to 22.6 per cent of the total eggs consumed. In the four Western Shore counties the non-local eggs consumed amount to 1,680,727 dozens, which is equivalent to 49.5 per cent of the eggs consumed in these counties.

On the basis of the farms surveyed in the Western Shore region 30.7 per cent of the eggs were sold through wholesale merchants; 29.3 per cent to hucksters; 19.8 per cent direct to consumers; 14.9 per cent to retail merchants; 1.8 per cent to hotels and restaurants; 1.5 per cent to local stores; 1.2 per cent to hatcheries; and 0.8 per cent through commission merchants. The distribution of eggs by method of sale varied considerably among the counties. For example, in Carroll County, 83 per cent of the eggs were sold to hucksters and only 6.3 per cent directly to consumers, while in Baltimore County, 60 per cent of the eggs were sold through wholesale merchants and 35 per cent were sold directly to consumers.

In the Eastern Shore area 56.4 per cent of the eggs were sold through wholesale merchants; 27.9 per cent to hucksters; 7.6 per cent to hatcheries; 5.7 per cent through commission merchants; 1.7 per cent to retailers; 0.4 per cent to hotels and restaurants; 0.2 per cent to local stores; and 0.1 per cent directly to consumers. More of the eggs in Caroline County seemed to be sold through hucksters than through any other agency, 64.5 per cent of the eggs being sold through this channel, while only 27.1 per cent were sold through wholesale merchants. The percentages of eggs sold to wholesale

Local Consumption of Eggs in Two Areas in Maryland, and Surplus Above Consumption Requirements

County	Population			Per Capita Consumption of Local-Eggs by Non-Farm People	Non-Farm Population	Local Eggs Consumed by Non-Farm People	Total Eggs Sold	Surplus
	Total	Farm	Per Cent Farm					
Wicomico	31,229	10,049	32.2	12.4	21,241	263,388	1,450,178	1,186,790
Worcester	21,264	10,461	48.3	18.7	11,163	208,748	1,984,734	1,775,986
Somerset	23,382	7,490	32.0	12.4	15,898	197,135	1,257,498	1,060,363
Caroline	17,387	8,809	50.6	19.5	8,809	171,775	1,436,105	1,264,330
Total	93,622	36,809	39.3	15.2	57,111	841,046	6,128,515	5,287,469
Baltimore	124,565	19,214	15.4	6.0	105,351	632,106	2,258,743	1,626,637
Harford	31,603	13,587	43.0	16.6	18,028	299,265	1,283,738	984,473
Carroll	35,978	14,856	41.3	16.0	19,288	308,608	3,022,837	2,714,229
Frederick	54,440	18,825	34.5	13.3	36,848	490,078	1,706,912	1,216,834
Total	246,586	66,482	27.0	10.4	179,515	1,730,057	8,272,230	6,542,173

Consumption of Non-Local Eggs in Two Areas in Maryland

County	Non-Farm Population	Non-Local Eggs		Per Cent
		Per Capita Consumption, Dozens	Total Consumption, Dozens	
Wicomico	21,241	6.6	140,190	28.8
Worcester	11,163	0.3	3,349	0.6
Somerset	15,898	6.6	104,927	28.8
Caroline	8,809	.....	.....	.....
Total	57,111	4.3	248,466	22.6
Baltimore	105,351	13.0	1,369,563	68.4
Harford	18,028	2.4	43,267	12.6
Carroll	19,288	3.0	57,864	15.8
Frederick	36,848	5.7	210,034	30.0
Total	179,515	9.4	1,680,727	49.5

merchants in the other counties are as follows: Worcester, 86.6 per cent; Somerset, 76.2 per cent; and Wicomico, 56.8 per cent.

Of the eggs marketed in the Eastern Shore area, 70 per cent went to the New York market; 11.7 per cent to the Philadelphia market; 10 per cent were sold locally; 5 per cent went to the Camden, New Jersey, market; 3.3 per cent to other markets such as Trenton and New Brunswick, New Jersey, while none of the eggs were reported as going to the Baltimore market. In the Western Shore area most of the eggs from Baltimore and Harford counties went to the Baltimore market, while in Frederick and Carroll counties most of the eggs were sold to hucksters, and probably found their way to the Baltimore, Philadelphia and Washington, D. C., markets.

REPORT OF COMMITTEE ON EDUCATION AND RESEARCH

PROFESSOR GEORGE D. QUIGLEY, Chairman

The Committee on Education and Research desires to report definite progress during the past six months.

The project of this committee is, broadly stated, a study of the food value of eggs having light yolks in comparison with those having dark yolks, both from the standpoint of the probable effect on the actual consumer of the egg, as well as the effect of the diet responsible for these color variations on the hen that laid the egg. While a study of the whole problem will involve considerable time and expense, it is felt that certain phases of it can be solved rather quickly, but that results in other phases will be much slower in making their appearance.

Your chairman is pleased to report to you that the starting of this project, which has been backed by resolution of the Council, is now well within the realm of possibility, and if facilities at the poultry plant can be adjusted, will go forward as a co-operative project of the Department of Poultry Husbandry and Chemistry, Doctors Jull and L. B. Broughton being in charge respectively. Of the basic importance of this project there can be no doubt, and if completed will have tremendous influence on feeding, nutrition, management, legislation and grading. Perhaps it will relieve the poultryman of that unhappy dilemma he is now in—that of being penalized when he feeds his chickens those foods which by all processes of reasoning should be better both for the chicken and the consumer of the egg.

In addition to this work, there has been set up at the University a project to study Vitamin A content of eggs produced by different breeds fed the same ration. For this experiment the White Leghorn and Barred Rock were chosen. The eggs will be fed to rats under controlled conditions, and in addition certain chemical determinations will be made. While work along these lines has been done elsewhere, it is quite probable that it will lead to other chemical and biological studies here at Maryland. For example, certain studies might be made dealing with the effect of storage on eggs which would be applicable to the needs of the Maryland Fresh Egg Law. The work is being performed under the auspices of the Department of Chemistry, Dr. L. B. Broughton, head, and Dr. Jull, head of the Poultry Dept.

The Committee on Research desires to call your attention to the fact that under the leadership of Dr. Jull and with the cooperation of Dr. Byrd, a request for a new Poultry Building and a fine research plant has been incorporated in the University program to the Legislature, and your endorsement of this program is desired. Certainly an enlarged poultry research program at the University, and especially one addressed to both the every-day problems as well as the more fundamental problems of the Poultryman will demand increased appropriations for facilities and maintainence.

REPORT OF THE PUBLICITY COMMITTEE

A. H. SNYDER, Chairman

Your committee on publicity has endeavored to disseminate information regarding activities carried on or sponsored by the Maryland State Poultry Council, especially through the medium of the public press. While it is recognized that much more in this line could be accomplished, it is believed that a fair beginning has been made.

Most of the publicity during the last year has been confined to news stories regarding meetings, exhibits, and the like. The large field of covering other activities of the organization, its policies, its value to individual members and to the poultry industry as a whole,

its plans and purposes, and matters of that nature has scarcely been touched. There is need for bringing together information bearing upon matters of that nature in such a way that it can be made the basis of informational stories. Actual preparation of such stories is not in itself a very arduous task when the information is at hand, but assembling of material sufficiently definite and complete for stories regarding activities in different parts of the State, and even without the State, is much more difficult. It will require the active cooperation of many members, and possibly it would be wise to greatly enlarge the membership of this committee in order that an added number of persons would feel some degree of responsibility in that respect. It will be a real accomplishment in the coming year if the committee on publicity can be so organized and extended that news and information will be coming from many sources and directions.

The publicity committee of the Maryland State Poultry Council has cooperated very closely with the publicity committee of the Northeastern Poultry Producers' Council, headed by Wallace S. Moreland. This has been true particularly in giving publicity to the meetings of the Northeastern Poultry Producers' Council and the Poultry Industries Expositions.

During the year, 16 news stories were sent to all newspapers in Maryland, including the daily papers and local county papers, and numbering approximately 80 papers. Mats showing pictures of the officers of the Northeastern Poultry Producers' Council were sent to all papers which could use mats, as part of the advance publicity of the NEPPCO meeting. We have no means for estimating the extent to which these stories appeared in the press.

In addition to the news stories, short items of news were sent to all papers from time to time.

As an indication of the nature of news stories sent out the following is given:

January 6—Advance story on Maryland Poultry Products Show. (A previous story had been sent in December).

January 27—Advance story on Maryland exhibit at Poultry Products Show in N. Y.

February 10—Story describing Maryland exhibit at Poultry Products Show in N. Y.

February 17—Story on Maryland winners at Poultry Products Show in N. Y.

May 4—Advance story on meeting at Orono, Maine.

June 22—Story on Orono meeting, giving Marylanders to appear on program.

July 13—Story about Marylanders to appear on program of Regional Broiler Conference, to be held in connection with Orono meeting.

August 17—Story of Maryland State Poultry Council tour to Orono.

June 8—Advance story on meeting of State Poultry Council at Ocean City.

August 31—Story about World Poultry Congress coming to U. S. in 1939.

October 5—General advance story on Poultry Industries Exposition in N. Y.

October 5—Story on Egg Show at Poultry Industries Exposition.

October 12—Story on Turkey Show at Poultry Industries Exposition.

October 12—Story on Baby Chick Show at Poultry Industries Exposition.

November 30—Advance story on Poultry Products Show in Baltimore.

November 30—Story about meeting of International Baby Chick Association meeting in Baltimore next summer.

In addition to the stories going to the press throughout the State, a number of stories were supplied to the daily press only.

REPORT OF CREDENTIALS COMMITTEE

Mr. Ivon T. Morton, acting chairman of the Credentials Committee, reported the following Delegates and Directors as properly certified to vote in the forthcoming election:

Dorchester County—Director, A. R. Peterson; Delegates, J. J. Dunn (absent), Walter Lankford (absent).

Kent County Poultry Federation—Director, Mrs. H. T. Williams; Delegate, O. E. Yerkey (absent).

Queen Annes County—Director, Jno. H. Moffett (absent); Delegates, Mrs. Algernon Carter, Mr. Kenneth W. Baker (absent).

Talbot County—Director, Mrs. W. W. Hopkins; Delegates, Ivon T. Morton, R. L. Tilghman (absent).

Caroline County—Director, Mrs. Mildred R. Kern; Delegates, Mr. Adam Fooks, Mr. W. H. Kleinwachter (absent).

Baltimore County—Director, Louis Ganssle; Delegates, Geo. H. Vandermaster (absent), Mrs. A. W. Sattler.

Prince George's County—None certified.

Maryland Egg Producers' Cooperative—None certified.

Maryland State Hatchery Ass'n.—None certified.

Maryland Turkey Growers' Ass'n.—None certified.

Mr. J. J. Cowan acted as Director from Prince George's County Poultry Association; Mr. H. D. Copeland for Maryland Egg Producers' Cooperative; Mr. C. F. Hines for Maryland State Hatchery Association, and were duly recognized as such by the President.

REPORT OF SECRETARY

W. H. RICE, Secretary.

Since a report of your Secretary was made on July 28 at our Summer Meeting at Ocean City covering the period January 1 to July 1, 1936, this report will principally deal with the 6 months' period July 1, 1936, to January 1, 1937, with brief references to the preceding 6 months' report.

I. B. C. A. Convention

One of the outstanding accomplishments of the Council during the past 6 months has been its successful support of the Maryland State Hatchery Association in securing the 1937 International Baby Chick Convention and Exposition for Maryland. Your Secretary acting as such for both these organizations campaigned at the 1936 Kansas City Convention of the I. B. C. A. July 19-22 along with our President, Mr. Copeland, and Mr. W. G. Ewald, Secretary of the Baltimore Association of Commerce. These efforts were followed up by efforts at later gatherings such as the Summer Meeting of N. E. P. P. Co. in Maine in August, N. E. P. P. Co. Poultry Industries Exposition in New York in November in addition to correspondence with State delegates and officers and Executive Directors of the I. B. C. A. The results of these cooperative efforts are well known to you.

1936 Summer Meeting

Those who attended our 1936 Summer Meeting and Banquet at Ocean City, July 27-28 appreciate that this was perhaps the most significant meeting of any poultry organization in the State up to that time. A total of 1400 people attended the 6 sessions of our meeting, an average of 233 per meeting. The presentations on the program were of the highest order of any of our Summer Meetings to date, and the presence of many distinguished guests at our banquet should be very significant to the future program and welfare of our Council. The work and cooperation from the local people at Ocean City and of the Committees of our Council made this meeting the success that it was. To Senator Wilmer F. Davis, we are particularly indebted for his deep interest and cooperative support in securing the attendance of Governor Nice and other distinguished guests.

1936 Summer Tour

The 1936 Summer Tour of the Council to the Northeastern Poultry Producers Council Meeting at Orono, Maine, was held August 23 to 28.

The response of the Maryland people to the meeting and tour was rather disappointing, as only 3 cars were in the tour, and only 18 Maryland people registered at the N. E. P. P. Co. meeting. Three Maryland cars, which were at the meeting, did not join in the tour.

The tour visited many of the most outstanding poultry farms in the Northeastern States and it is for those who did not avail themselves of the opportunities the tour and meeting afforded that should receive our immediate and future concern.

Second Poultry Industries Exposition

The Council officially participated in the Second Poultry Industries Exposition of the Northeastern Poultry Producers Council in New York, November 10-14, 1936, with an exhibit and delegates, probably the largest number of Maryland people attending any N. E. P. P. Co. event outside of Maryland attended the Exposition. Maryland egg producers and turkey breeders won outstanding honors at the exposition. Your Secretary supervised the joint exhibit of the University and State Poultry Council, attended numerous committee meetings and conferences. Maryland should play a much more prominent part in these expositions than it has in the past and has much to gain in doing so.

County Poultry Association Activities

Your Secretary has attended one show and two annual meetings of County Poultry Associations during the past six months, as well as one County Association Directors' meeting. Numerous conferences with officers of County Associations on organization matters have been held and every possible assistance rendered.

1937 Poultry Products Show

Considerable effort has been put on the development of details of our coming poultry products show, covering its organization, catalogue, publicity, trophies, advertising, etc. Definite support for an enlarged 1938 show has developed among the wholesale and retail distribution interests of the State, and under proper supervision and division of responsibilities a complete Maryland poultry industry show can and should be successfully staged in Baltimore in 1938. To do this will involve a host of responsibilities that must of necessity be headed by one individual, in order to be orderly and successfully staged.

Correspondence, Etc.

During 1936 your Secretary has written 1,890 first class letters, 358 second class letters and mailed 3,613 pieces of second class mail such as programs, catalogues, proceedings, etc., on Council business affairs.

1937 Needs

With an ambitious legislative program before our Council for 1937, besides meetings, and routine work, demands upon your Secretary will be increased. The responsibilities of added organization details in addition to extension education duties now evolving on your Sec-

retary who is on a reduced travel expense budget for 1937 will result in difficulties which will be difficult to surmount. To cheerfully bear their share of detail responsibilities when assigned to committees by officers of our Council by our Council supporters will aid materially to make 1937 the banner year of accomplishment for our organization.

The valuable assistance rendered the Secretary on numerous matters by various officers and individuals during the year is gratefully acknowledged with sincere appreciation.

To be relieved of the duties of Secretary of the Maryland State Hatchery Association and the Chairmanship of the Breed Improvement Committee of our Council have helped greatly in making it possible for your Secretary to give the necessary attention to the duties of the office of Secretary.

Our Council needs greater support in its various committees, both standing and temporary.

Those who have not assumed active responsibilities in our Council should bear in mind that they and others have as much to gain from the efforts of the officers and the others who are endeavoring to serve the best interests of our industry as any other individual. There is no paid office in our Council, and a greater sharing of the responsibilities of the future welfare of our industry is the best means of demonstrating your desire to insure a brighter future for the industry of which you are a part and for which you will reap your share of the rewards.

REPORT OF RESOLUTIONS COMMITTEE

MRS. W. W. HOPKINS, Chairman.

Adopted at a meeting of Maryland State Poultry Council, Baltimore, January 14, 1937, favoring federation of all poultry producing, breeding and marketing organizations into a National Council of Poultry Producers.

1. WHEREAS: We believe industry self-determination, subject to mediation by the Government is sound in principle, and

WHEREAS: The accepted method of industry self-determination in Congress and at Washington is the authoritative national organization, and

WHEREAS: The poultry industry is the one remaining major division of agriculture without an organization speaking authoritatively for the industry, and

WHEREAS: We believe the more than 400 organizations of poultry producers and breeders now in existence constitute an adequate and sound basis on which to build a national federation or council that can speak authoritatively for the industry, and

WHEREAS: Much of the effort of the many poultry organizations at present fails to find expression nationally, due to inadequate organization at the top, and

WHEREAS: There are many problems of vital importance facing our industry which will require the utmost conservation of our energy and the greatest coordination of our efforts, and

WHEREAS: We believe that in unity there is strength and courage,

Therefore Be It Resolved: By the Maryland State Poultry Council in annual meeting assembled at Baltimore, January 12-14, 1937, that we favor the federation of present national, regional and state poultry producing, breeding and marketing organizations into a national council of poultry producers.

Be It Further Resolved: That the Secretary of the Maryland State Poultry Council be authorized and directed to take whatever action is deemed advisable to effect the purpose of this Resolution.

Attest:

W. H. RICE, *Secretary.*

2. *Resolved:* That the Maryland State Poultry Council hereby wishes to express its appreciation of the interest and untiring efforts of Dr. Mark Welsh, his associates and others who worked so long and faithfully to secure for the Poultry Industry of the Eastern Shore, the Livestock Sanitary Service Laboratory at Salisbury.

3. *Resolved:* That the Maryland State Poultry Council wishes to express its appreciation of the valuable services involving both time and personal expense rendered by Mr. Harry H. Rieck during his term of office as Vice-President and Chairman of the Organization Committee of this Council.

4. *Resolved:* That the State Poultry Council expresses its deep appreciation to the Maryland Farm Bureau for its splendid cooperation and support of the Poultry Council's program and the encouragement of the Egg and Chick Show at this meeting.

5. *Resolved:* That the Maryland State Poultry Council hereby expresses its very sincere appreciation of the valuable and courteous service of Miss Minnie Fyffe, who has worked so faithfully and long during the Poultry Products Show.

6. *Resolved:* That the Maryland State Poultry Council hereby expresses its sincere appreciation to Mr. James M. Gwin for his splendid service in judging the Egg Exhibit and very interesting talk to our Association, also to Mr. Robert R. Slocum for his able assistance.

7. *Resolved:* That the members of the Maryland State Poultry Council in meeting here assembled hereby express our appreciation

of the services of Mr. H. L. Shrader and Mr. Geo. D. Quigley in judging the Baby Chick Show.

8. *Resolved:* That the Maryland State Poultry Council hereby expresses its appreciation of the courteous and prompt service rendered by the management of the Lord Baltimore Hotel during the annual meeting of the Council.

9. *Moved and Seconded:* That we endorse the Proposed Poultry Research Laboratory and Office Building and Research Plan for the Poultry Department at the University of Maryland.

Treasurer J. J. Cowan submitted his report showing a balance of $1019.05 on hand December 31, 1936.

The Auditing Committee consisting of Chas. F. Hines, Chairman, A. R. Peterson and H. D. Copeland reported on a check of Treasurer's accounts, stating that accounts were in balance and thanked the Treasurer for his assistance in the audit.

Mr. Louis Ganssle, Chairman of the nomination committee, made the following report as nominations for the annual election of officers:

For President—H. D. Copeland
For First Vice-President—J. W. Evering
For Second Vice-President—Mrs. W. W. Hopkins
For Secretary—W. H. Rice
For Treasurer—John J. Cowan

In the election which ensued the following officers were duly elected for 1937:

President—H. D. Copeland
First Vice-President—J. W. Evering
Second Vice-President—Mrs. W. W. Hopkins
Secretary—W. H. Rice
Treasurer—John J. Cowan

For Director and Delegates to the Northeastern Poultry Producers Council for 1937 the following were duly elected:

Director—H. D. Copeland
Delegates—Louis Ganssle, J. W. Evering, R. L. Tilghman.

For Director and Delegates to the Maryland Farm Bureau Federation the following were duly elected:

Director—H. D. Copeland
Delegates—Mrs. Algernon Carter, Mrs. C. J. Kern, Mrs. W. W. Hopkins

Meeting adjourned—12:45 P. M.

REPORT

OF THE

Boys' and Girls' 4-H Club Leaders' Conference

Baltimore, Maryland

Wednesday Morning, January 13th

Led by Miss Dorothy Emerson, Girls' Club Agent;
E. G. Jenkins, State Boys' Club Agent.

A large group of 4-H Club leaders, former club members, and county extension agents met in the ballroom of the Lord Baltimore Hotel for round-table discussion of the following questions:

To what extent can the 4-H Club program contribute to the welfare of the community? What does it offer that cannot be secured elsewhere?

What do leader-type citizens owe to the community? Why be a 4-H Club local volunteer leader?

How can more 4-H Club leaders be secured? Should they be trained from Older Club Youth? Who should select them? What are the requisites?

What kind of help can the county and State extension agents give?

In the main the discussion was based on personal experiences of former club members and leaders.

The 4-H Club program contributes to the welfare of the community in ways difficult to measure. Some items brought out were:

Initiative—No other method of education so develops it.

Group Action—Club members are citizens of clubs, they carry co-operative action on into other affairs.

Self Expression—In no other way are youth so learning to express their own opinions before groups of their equals.

Cooperative Leadership—Leaders in church, grange, school and other organizations are growing up in 4-H Clubs due to the achieving program.

It was brought out that 4-H Club work does not compete with schools; it is not vocational education but demonstration education. As such it concerns itself with changing attitudes in order to assure

the improving of skills or increasing of knowledge. This, it seems, is its real contribution.

Leader-type citizens grow up in 4-H club work. They owe their services to the community and should find their places in the affairs of the community. No one over-pays in service a community that gives him all that Maryland communities are now giving in education, protection, roads, etc. The leader owes his best in leading youth to fit themselves for better living in better communities.

More 4-H Club leaders can be secured from Older Youth and can be trained in the technique of leadership through the Extension Service.

INDEX

A

Page

Abrams, G. F.—Report 243
Anderson, E. J.—Address 160

B

Baker, K. W.—Address 219
Bittenbender, H. A.—Address 372
Blake, M. A.—Address 199
Boarman, William F.—Report 251
Bryan, C. E.—Address 120
Burdette, Roger F.—Address 281
Byrd, H. C.—Address 349, 371

C

Cash, J. C.—Address 346
Childs, W. F., Jr.—Address 39
Clark, J. Harold—Address 181
Clay, Harold J.—Address 254
Cooke, Morris L.—Address 29
Cordner, H. B.—Address 267
Cory, E. N.—Address 288

D

Davis, Redman B.—Address 352
DeVault, S. H.—Address 380
Derr, Edward—Address 328, 330
Downey, Mylo S.—Address 326

E

Ernst, Fred C.—Address 340, 345

F

Fisher, D. F.—Address 126

G

Gallup, Gladys—Address 72
Giles, Mrs. J. D.—Address 50
Gourley, J. H.—Address 179, 204
Grau, Fred V.—Address 225
Gray, Chester H.—Address 64
Greene, Laurenz—Address 132
Groves, A. B.—Address 141
Gwin, James M.—Address 365

H

Page

Harvey, W. R.—Address 310
Hopkins, Mrs. W. W.—Address 377
Hough, W. S.—Address 176
Hull, Harry—Address 54

I

Ikeler, Kenneth C.—Address 347

J

Jehle, R. A.—Address 291
Jull, Morley A.—Address 366

K

Klingaman, H. E.—Address 172

L

Lothrop, R. E.—Address 259

M

McConnell, J. S.—Address 160
McGregor, W. A.—Address 332
McVean, J. D.—Address 220
Merryman, L. McL.—Address 323
Metzger, J. E.—Address 218
Miller, Carroll R.—Address 193

N

Nuttle, Harry H.—Address 11

O

O'Sullivan, Sam—Address 333, 340

P

Parker, M. M.—Address 295
Parran, Hon. Thomas—Address 361

Q

Quigley, George D.—Address 385

R

Report of Auditing Committee—Farm Bureau 22
Report of Auditing Committee—Horticultural Society 210
Report of Credentials Committee—Farm Bureau 49

Page

Report of Committees—Vegetable Growers Association 300
Report of Home and Community Committee—Farm Bureau 66
Report of Resolutions Committee—Horticultural Society 210
Report of Resolutions Committee—Farm Bureau 94
Report of Secretary-Treasurer—Crop Improvement Association 238
Report of Secretary-Treasurer—Farm Bureau 15
Report of Secretary-Treasurer—Horticultural Society 119, 120
Report of Secretary-Treasurer—Stockmen's Association 305
Report of State Tax Committee—Farm Bureau 83
Report of Treasurer—Crop Improvement Association 240
Rice, W. H.—Address 389
Rothgeb, R. G.—Address 233

S

Schneiderhan, F. J.—Address 151
Schrader, A. L.—Address 138
Schuster, George L.—Address 221
Shelby, F. H.—Address 214
Snyder, A. H.—Address 386
Stabler, Stanley P.—Address 303
Symons, T. B.—Address 370

T

Termohlen, W. D.—Address 374
Thomas, R. P.—Address 299
Thurston, H. W., Jr.—Address 143

W

Weinberger, J. H.—Address 121
Welsh, Mark—Address 318

Z

Zundel, George L.—Address 188

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